# AUTHOR INDEX

A

Aasa, R., 198 Abe, H., 422, 427 Abe, R., 39 Abe, Y., 34, 409 Abdulnur, S., 272 Abel, W. R., 87, 93, 94, 95, 96, 101 Abeledo, C. R., 136 Abell, P. I., 212 Abragam, A., 197, 206 Abraham, B. M., 84, 98 Abraham, R. J., 519 Abrahamson, A. A., 272 Abramov, V. N., 147 Abramovitch, R. A., 207 Abramson, E., 328 Abrikosov, A. A., 83, 86, 87, 92, 96, 97 Accascina, F., 469, 470 Ackerman, J. F., 66 Adachi, G.-Y., 138 Adadarov, G. A., 361 Adami, L. H., 455, 458 Adams, D. G., 506 Adams, E. D., 90, 91, 92 Adams, J. Q., 208 Adams, W., 263 Adde, R., 213, 217 Adman, R., 208 Admiraal, L. J., 366 Adrian, F. J., 481 Afimov, N. V., 216 Affrossman, S., 138 Affsprung, H. E., 68, 76 Agahigian, H., 496, 521 Agar, J. N., 469-88; 475, 476, 478, 479 Agishev, A. S., 502 Ahrens, T. J., 361 Aigueperse, J., 140 Akhanshchikova, L. A., 458 Akinrimisi, E. O., 372, 383, 385, 386, 387 Akopyan, L. A., 210 Albasiny, E. L., 260 Alberty, R. A., 26 Albright, L. F., 77 Albery, W. J., 15 Alder, B. J., 32, 34, 37, Alder, B. J., 32, 34, 37, 39, 42, 44, 46, 49, 52, 67, 360, 361, 362, 363, 365, 410, 414, 484
Aldred, A. T., 461
Aleksandrov, I. V., 149 Alexakos, L. G., 492 Alexander, A. E., 359 Alexander, A. G., 443

Alexander, L. E., 430 Alexander, P., 443 Alexander, S., 520 Alkemade, C. T. J., 405 Allan, E. A., 521 Allavena, M., 260 Allcock, G. R., 156 Allen, E. A., 520 Allen, F. W., 371 Allen, H. C., 237 Allen, L. C., 217, 258, 259, 268, 270, 491 Allen, M. B., 315 Allen, P. E. M., 359 Allen, T. L., 464 Alley, S. K., 72, 73 Alley, S. K., Jr., 510, 521 Allerhand, A., 72, 74 Allnatt, A. R., 407 Allred, A. L., 73, 512, 521 Alsop, M., 365 Alter, W., 284 Al'tshuler, L. V., 360, 361 Al'tshuler, S. A., 197, 199 Amano, A., 460 Amberg, C. H., 148 Ambrose, J. R., 454 Amdur, I., 63, 66, 271 Amesz, J., 314, 334 Amis, E. S., 471 , 308 Amma, E. L., Amos, T., 270 Anantaraman, A. V., 77 Anderva, L. B., 138 Anderko, K., 109 Andersen, H. C., 404, 405 Andersen, K. K., 514 Anderson, A. C., 85, 86, 87, 88, 89, 90, 92, 93, 94, 95, 96, 100, 101, 102 Anderson, E. W., 15, 496, 499, 508, 520 Anderson, D. L., 72 Anderson, J. E., 27 Anderson, J. M., 496, 510 Anderson, J. R., 72, 76, 133, 137 Anderson, P. W., 97, 263, 330 Anderson, R., 72, 74 Anderson, W. A., 490, 498 Ando, T., 272 Andresen, H. G., 235 Anet, F. A. L., 507, 520 Angell, C. L., 378, 379 Aono, S., 204 Apfel, J. H., 330

Apt, C. M., 358 Arai, S., 205 Arai, T., 268, 270 Arbuzov, A. E., 206 Archer, G., 67, 68 Ard, W. B., 89 Arin, M. L., 459 Aripelzhanov, Sh. A., 212 Arison, B. H., 334 Armitage, P. T., 472 Armstrong, G. T., 456 Arnold, W., 318, 320, 325, 326, 327, 337 Arnold, W. E., 327, 330 Arnon, D. I., 315, 339 Arnonoff, S., 343 Arons, J. De S., 78, 366 Arshadi, M., 459 Arthur, J. R., Jr., 1 Arthur, P., Jr., 216 137 Arthur, W. E., 326 Asano, T., 138 Ascoli, F., 383 Ashcroft, S. J., 462 Astaf'ev, L. V., 145 Astbury, W. T., 440, 445 Atherton, N. M., 206, 207 Atkins, K. R., 83, 88, 95 Atkins, P. W., 208, 213 Atkinson, J. R., 27 Auramenko, L. I., 212 Aurisicchio, A., 373 Aust, R. B., 365 Austin, B. J., 263 Avakian, P., 328 Ayer, W. A., 340 Aynsley, E. E., 244 Ayscough, P. B., 205, 208, 209 Azatyan, V. V., 210 Azumi, T., 327, 328

D

Babb, S. E., 350, 365
Bächmann, K., 17
Bacon, G. E., 128
Bacon, J., 495, 501, 503
Bader, R. F. W., 261
Baer, S., 55
Bagdasarian, Kh. S., 213
Bagus, P. S., 256, 257, 258
Bailey, K., 440
Baird, J. C., 245
Bak, B., 244
Bakanova, A. A., 360
Baker, B. G., 133, 137
Baker, E. B., 490

Applequist, J., 387

Baker, J. G., 245 Bakh, N. A., 212 Balandin, A. A., 131, 145 Balchin, A. S., 361 Baldeschwieler, J. D., 490, 494, 495, 496, 498, 510 Baldini, G., 330 Baldwin, R. L., 372, 383, 384, 386, 387 Balescu, R., 77, 402 Ballestracci, R., 124 Bandzaitis, A., 262, 266 Banerjee, K., 472 Banister, T. T., 324, 326, 338 Bannon, W. J., 472 Banwell, C. N., 493 Barachevskii, V. A., 149, Baranov, E. V., 149, 208 Baranowski, B., 476 Bardasis, A., 97 Bardos, A. M., 126 Bardos, D. I., 126, 128 Barfield, M., 507, 509 Barker, C., 450, 451, 455
Barker, J. A., 31, 33, 34, 50, 51, 55, 58, 63, 65, 70, 71, 72, 75
Barnett, L., 373 Barnett, M. P., 263, 264, 269, 271 Baron, R., 366 Barrett, A. H., 239 Barron, Y., 142 Bartell, L. S., 228, 229 Barth, C. A., 210 Bartlett, N., 272 Barton, G. W., 243 Barton, G. W., Jr., 491 Basila, M. R., 147 Basilio, C., 373 Bass, G. E., Jr., 458 Bassler, G. C., 489 Basu, S., 381 Bates, R. G., 473, 474 Batta, I., 139 Baudet, M. J., 204 Bauer, R. K., 239 Baughan, E. C., 205 Baum, J. L., 100, 101 Baur, M. E., 415 Bautista, R. G., 450, 460 Baxendale, J. H., 22 Bay, Z., 331, 390 Bayes, K., 217 Bearman, R. J., 477, 478 Beaton, J. M., 340 Beauchamp, J. L., 504 Beaudet, R. A., 231, 240 Beauregard, L. G., 443 Beck, A., 127 Beck, P. A., 110, 126, 128 Beck, W. H., 473 Becker, E. D., 521 Becker, F., 72, 76

Becker, G. E., 146 Becker, R. S., 343 Beckett, A., 23 Bedford, A. F., 451, 452 Beenaker, J. J. M., 72, 75 Beer, M., 373, 374 Beezer, A. E., 451, 452 Behrend, G., 475 Bekarevich, I. L., 95, 96 Belford, J. A., 208 Bell, J. A., 23, 463 Bell, R. P., 15, 27, 474 Bell, R. T., 474 Bellemans, A., 69 Bendall, R., 312 Bendit, E. G. J., 443 Béné, G. J., 492 Benedek, G. B., 217, 349 Benjamin, L., 72, 74 Bennett, C., 388 Bennett, M. J., 135 Benning, W. F., 355 Benoit, H., 520 Benott, H., 520
Benson, B. B., 68
Benson, G. C., 71, 72, 74
Benson, R. E., 518
Benson, S. W., 350, 356, 359, 460, 461, 462, 482
Bent, H. A., 505
Benzer, S., 373
Berg, P., 372, 375, 383
Berg, R. A., 262
Bevgqvist, M. S., 484, 518
Bergauist, P. L., 371 Bergquist, P. L., 371 Bergson, G., 520 Berkeley, P. J., Jr., 73, 521 Berkowitz, J., 460, 464 Berlin, T., 415 Bernal, I., 203, 205, 211 Bernardes, N., 83, 98, 100, 101, 102 Bernstein, H. J., 505, 519 Berry, R. S., 263, 269, 270, 271 Bersohn, R., 198, 382, 458 Berson, J. A., 350, 356 Bertaut, E. F., 124 Berthier, G., 204 Bertrand, J. A., 516 Bertrand, R. R., 271 Bertsch, L., 147 Besnard, A., 521 Bethe, H. A., 255 Betts, D. S., 93 Bhacca, N. S., 498, 516 Bhattacharyya, S. N., 77 Bhimasenachar, J., 77 Bickelhaupt, F., 340 Bielafiski, A., 139 Bigam, G., 496
Billes, F., 72, 74
Billinge, B. H. M., 462
Biloen, P., 216
Bingel, W. A., 269

Bird, G. A., 404

Bird, G. R., 245 Bird, R. B., 31, 64, 65, BB. Birss, F. W., 258 Bishop, D. M., 260 Bishop, E. O., 509 Bishop, J., 496 Bishop, N. I., 334, 338, 340 Björk, I., 383, 387 Black, C., 77 Black, P. J., 495 Blaker, J. W., 240 Blakey, J. P., 366 Blandamer, M. J., 214, 481 Blanks, R. F., 72, 74 Blashko, C. A., 387 Blauer, J., 459 Bleaney, B., 122, 124 Blinks, L. R., 313, 335 Blinder, S. M., 198 Bloembergen, N., 217 Blomgren, G. E., 54 Bloom, M., 401, 404, 499, 501 Blue, G. D., 460 Blum, S. C., 471 Blumberg, W. E., Blyholder, G., 148 Boardman, N. K., 322 Boardman, N. K., 322 Boarlight, L. G., 72, 74 Bock, E., 519 Bock, R. M., 374 Bockris, J. O'M., 155 Bodea, C., 207 Boden, N., 495 Bodenseh, H. K., 484 Roedtker, H., 387 Boedtker, H., 387 Bogatkin, R. A., 145 Bogoliubov, N. N., 396, 397, 398 Bogorad, L., 317 Böhme, D., 70 Bolotin, A. B., 266 Bolton, H. C., 390 Bolton, J. R., 203, 205, 207, 208, 210 Bond, G. C., 131, 144 Boned, M. L., 451 Bonner, W., 334, 338 Bonner, W. D., Jr., 337, 338 Bonnett, R., 340 Boorstein, S. A., 214, 215 Boreskov, G. K., 131, 135, 145, 150 Borisova, M. S., 147 Born, M., 31, 36, 156, 158, 168, 169, 483 Borovkova, N. I., 458 Borowitz, S., 265 Boswijk, K. H., 272 Bott, R. W., 145 Bottomley, G. A., 65 Botts, J., 429, 434

Botré, C., 383

Boublik, T., 72, 76 Boudart, M., 131 Bourn, A. J. R., 514 Bovey, F. A., 496 Bowen, W. J., 444 Bower, V. E., 473 Bowers, K. W., 204, 208 Bowman, A. L., 455 Box, H. C., 212 Boyd, R. H., 453, 483 Boyd, R. K., 461, 462 Boys, S. F., 262, 263 Bozorth, R. M., 121 Brackett, E., 460 Brackett, F. S., 311 Bradbury, A., 216 Bradley, D. F., 304, 390 Bradley, R. B., 521 Bradley, R. S., 365 Brahms, J., 383 Brandon, R. W., 216 Bratoz, S., 260 Bray, B. G., 360 Bray, P. J., 209, 213 Brazhnik, M. I., 360 Breck, W. G., 476 Breene, R. G., 258 Brennan, D., 133 Brenner, S., 373 Breslow, R., 216 Brewer, D. F., 83, 85, 86, 88, 100, 101 Brewer, L., 460 Brey, W. W., Jr., 520 Brice, D. K., 200 Britton, D., 262 Brivatti, J., 213 Brody, M., 322, 323 Brody, S. S., 322, 323, 324, 326 Brokaw, R. S., 404 Bronsted, J. N., 68, 69 Brout, R., 414, 415 Brouwer, D. M., 149 Brovetto, P., 204 Brower, K. R., 353, 356, 357 Brown, A. E., 443 Brown, C. A., 145 Brown, E., 263 Brown, G. H., 471 Brown, G. M., 434 Brown, H. C., 145, 146 Brown, I., 71, 73 Brown, I. M., 216 Brown, J. S., 321 Brown, L. C., 17 Brown, R. D., 265, 270 Brown, R. J. C., 500 T. H., 201, 202, Brown, 498, 510 Brown, T. L., 506 Browne, J. C., 263, 264 Browne, M. E., 200 Brownstein, S., 520 Brout, R., 254

Broyles, A. A., 38, 40, 42, 43, 409 Brueckner, K. A., 84, 88, 90, 97, 262, 267 Brush, S. G., 349 Brushmiller, J. G., 308 Bryce, W. A., 23 Buben, N. Ya, 212, 213, 216 Buc, H., 521 Buchard, R., 147 Buchert, H., 512 Buchler, S. A., 210 Buchschacher, P., 340 Buckingham, A. D., 65, 67, 482, 491, 503, 511 Buckingham, R. A., 271 Buckley, R. A., 128 Buehler, R. J., 34, 48, 51 Buff, F. P., 410 Buisson, P., 145 Bukanaeva, F. M., 150 Buley, A. L., 210 Bull, H. B., 434 Bullock, E., 510, 513, 521 Bumgardner, C. L., 514 Bundy, F. P., 349, 361, 365 Bunnenberg, E., 281 Burbridge, P. A., 519 Burd, L. W., 490 Bürer, Th., 309 Burke, E. A., 265 Burnett, M. G., 72, 75 Burrell, J. W. K., 340 Burton, A., 373 Burwell, R. L., Jr., 131-54; 134, 137, 140, 141, 142, 143 Busfield, W. K., 364 Buss, J. H., 462 Butcher, E. G., 365 Butler, W. L., 317, 324, 325, 330, 338 Buttet, J., 209 Butuzov, V. P., 355 Byckling, E., 33 Byliana, E. A., 136

C

Cable, J. W., 123
Cadiot, P., 142
Cagle, F. W., 356
Cahill, P., 239
Calilat, R., 147, 148
Cairns, J., 372
Calats, J. L., 265
Caldwell, D. J., 287, 294, 306, 518
Callaway, J., 257, 267
Calvet, E., 63, 449
Calvin, M., 326, 327, 330, 339, 343
Cameron, D. M., 72, 74, 521
Campion, R. J., 17, 165, 175, 190, 191

Candlin, J. P., 17, 158, 165, 175, 190, 191 Canellakis, E. S., 371 Canjar, L. N., 66 Cantoni, G. L., 372, 373, 375, 387 Canty, G., 442 Caralp, L., 515 Carevale, E. J., 356 Caris, J. C., 328 Carley, D. D., 43, 409 Carlson, C. M., 55 Carlson, F. F., 213 Carr, D. T., 503 Carrington, A., 197, 199, 203, 205, 206, 207, 208, 210 Carson, A. S., 462 Carswell, A. I., 66 Cartersall, R., 209 Caudle, J., 473 Cavalieri, L. F., 371 Cavanaugh, J. R., 495 Cavell, R. G., 458 Cawley, S., 508, 516 Cederstrand, C., 314 Cernuschi, F., 53 Cerný, S., 137 Chachaky, C., 214 Chaigneau, M., 519 Chakravorty, A., 518 Challis, L. J., 94 Chalmers, R., 311, 314 Chalvet, O., 201 Chamberlin, M., 372, 383 Chambers, W. G., 403 Champers, W. G., 403 Champetier, G., 441 Chan, S. I., 245, 519 Chance, B., 26, 337, 338 Chang, S., 55 Chang, H. W., 216 Chao, C. C., 125 Changelle, F. 373 Chapeville, F., 373 Chapman, D., 495, Chapman, L. D., 147 Chapman, O. L., 507, 516 Chargaff, E., 371, 375, 386 Charman, H. B., 139 Chatelain, A., 209 Chang, T.-Y., 387 Chernyshev, E. A., 208 Cherry, L. V., 124 Chesnut, D. A., 415 Chesnut, D. B., 199, 211, 216, 391 Chester, G. V., 395 Chiang, R., 423 Chiu, Y-N., 214 Chizmadzhev, Y. A., 155, 156, 158, 161, 162, 163, 164, 165, 168, 171, 172, 173, 174, 179, 184, 185 Chkheidze, I. I., 212 Chodkiewicz, W., 142 Choh, S. T., 396 Choi, E. I., 20

Choi, S., 326, 331 Christ, H. A., 521 Christensen, D., 244, 245 Christensen, J. J., 474 Christian, C. S., 361, 362, 363, 365 Christian, S. D., 68, 76 Chueh, P. L., 77 Chung, H. S., 52 Chung, S. U., 40, 42 Cifferi, A., 422, 425, 426, 427, 428, 445 Cimino, A., 140 Cízěk, J., 264 Clark, H. C., 458, 506 Chaiken, A. M., 455 Challoner, A. R., 452 Chao, J., 450 Chernykh, L. V., 457 Chipman, J., 455 Clarke, R. L., 450 Clayton, G. T., 412 Clayton, R. K., 311, 312, 327, 330 Clementi, E., 258, 259, 261, 263, 268, 270, 272 Clifton, D. G., 66 Closs, G. L., 216, 340, 343, 506 Closs, L. E., 506 Clouser, P., 239 Cobb, T. B., 515 Cochran, E. L., 208 Coe, A. B., 430 Coe, G. R., 520 Coekelbergs, R., 133 Coetzee, J. F., 471 Coffer, H. F., 360 Cohen, C., 440, 444 Cohen, E. G. D., 31, 52, 396, 402 Cohen, H. D., 258 Cohen, M., 257, 261, 263 Cohen, M. H., 263 Coillet, D. W., 355 Coing-Boyat, J., 124 Colburn, C. B., 461 Cole, G. H. A., 31, 39 Coleman, A., 262, 272 Coleman, D. J., 450, 451 Coller, B. A. W., 270 Collins, G., 199 Collinson, E., 18 Colmano, G., 322 Colomina, M., 451 Colpa, J. P., 202, 203 Companion, A. L., 264, Conant, J. B., 363 Condon, E. U., 284 Conner, T. M., 14, 489 Connolly, J. F., 66 Comors, W. J., 372 Conocchioli, T. J., 158 Cook, B. M., 470, 471 Cook, C. D., 512 Cook, R. J., 212, 213

Coolidge, A. S., 265 Cooper, J. R. A., 260 Cooper, J. W., 261 Cooper, L. N., 97 Cooper, W. J., 456 Coopersmith, M., 414 Coops, J., 450 Copeland, C. S., 359, 482 Coppens, P., 207 Copson, H. R., 473 Corbato, F. J., 264 Corbett, P., 461 Cordes, S., 373 Coremans, J. M. J., 72, 75 Corenzwit, E., 121 Corey, R. B., 376, 440 Corio, P. L., 499 Corliss, L., 116, 123 Cormack, D., 138 Corneliussen, R., 72, 76 Cornet, D., 142 Cornwell, C. D., 492 Corradini, P., 445 Corset, J., 209 Cossee, P., 150 Costain, C. C., 226, 236, 237, 245 Costolnick, J. J., 66 Cotton, J. D., 139 Coull, J., 66 Coulson, C. A., 110, 161, 162, 180, 181, 182, 257, 261, 263, 267, 270
Courtois, M., 149
Cova, D. R., 364 Covington, A. K., 473 Cowell, R. D., 205, 208 Cox, A. P., 236, 244 Cox, J. D., 452, 453, 464 Cox, P. F., 508 Cox, R. A., 379, 380, 381, 383 Coyle, C. F., 456 Craig, D. P., 330 Craig, N. C., 494 Craig, P. P., 83, 407 Craig, R. A., 484, 520 Craig, R. S., 126 Cramarossa, F., 140 Cramer, R. M. R., 215 Crane, F. L., 335 Crawford, E., 144 Creeth, J. M., 479 Crespi, H. L., 371, 383 Creswell, C. J., 73, 521 Crewther, W. J., 440, 444 Crick, F. H. C., 373 Crickard, R. G., 311 Cross, A. D., 509, 516 Crothers, D. M., 388 Crutchfield, M. M., 491 Csakvary, F., 520 Csicsery, S. M., 142 Csizmedia, I., 270 Culvahouse, W. P., 200 Cunningham, J., 213

Curl, R. F., 233, 245 Curran, D. R., 361 Curtiss, C. F., 31, 34, 48, 51, 53, 64, 65, 66, 398, 403 Cutler, D., 200 Cutler, D., 200 Cyzak, S. J., 258

D

Dacre, D., 71 Dahler, J. S., 50, 52, 403 Dainton, F. S., 18, 364 Dailey, B. F., 513 Dailey, B. P., 225, 517, 519 Dais, C. F., 208 Dakshinamurty, P., 72, 76 Dalgarno, A., 257, 261, 271 Damle, V., 387 Danckwerts, P. V., 16 Daniels, F., 311 Danon, A., 375 Danyluk, S. S., 508, 512, 516, 520 D'Aprano, A., 471, 480, 483 Darby, J. B., Jr., 128 Darby, J. B., Jr., 12 Das, M., 261 Das, P., 101 Das, T. P., 198, 519 Datans, W. R., 208 Datsur, S. P., 71 Datta, S. P., 474 Daudel, R., 201 Daunt, J. G., 83-108; 83, 84, 85, 86, 88, 90, 98, 100, 101, 102, 103, 104, 105 Davenport, A. J., 70, 77 David, H. G., 48, 49 Davidson, A. W., 72, 74 Davidson, E. R., 253, 261, 262, 265 Davidson, J. B., 325, 327 Davidson, N., 159, 381, 383, 385 Davies, D. R., 372, 383 Davies, D. W., 264, 517 Davies, J. V., 454, 455 Davis, D. D., 121 Davis, G. G., 20 Davis, G. T., 514 Davis, H. T., 263 Davis, J. C., Jr., 376 Davydov, A. S., 321 Davydov, B. E., 145 Davydov, V. Ya., 148 Dawling, L. M., 444 Dawson, J. P., 453, 454 Dawson, L. R., 471 Day, L. A., 25 Dayan, E., 499, 519 De, K. S., 140 Deal, C. H., 72, 74 Deal, W. E., 360

Deans, H. A., 72, 75 de Boer, E., 198, 199, 202, 203 de Boer, J., 31, 35, 39, 48, 49, 52, 53, 362 de Bruyn Ouboter, R., 101 de Carli, P. S., 361 De Carlo, V., 259 de Groot, M. S., 215, 216 Deguchi, Y., 206, 208, 209 de Heer, J., 269, 271 Dehl, R., 210 Dehn, T., 259 de Jong, J., 205 Dekker, C. A., 383 DeLaMare, P. B. D., 489 Delapalme, A., 124 De Lerma, B., 383 Dell, R. M., 139 Della, E. W., 520 Delmas, G., 70 Delmas, G., 70 Del Re, G., 269 de Maeyer, L., 13, 16, 19, 22 DeMicheli, R., 501 Demichowicz, J., 476 Demichowicz-Pigoniowa, J., 476 Den Besten, I. E., 135, 136, 137 De Neui, R. J., 228 Denisov, G. S., 73 d'Entremont, J. C., 455 de Prater, B. L., 455 Derén, J., 139 De Rezende-Pinto, M. C., 315 De Rocco, A. G., 35, 42 Derr, E. L., 77 Derr, V. E., 240 Desmyter, A., 69 Dessy, R. E., 520 Devanathan, M. A. V., 473 De Voe, H., 270, 290 Devonshire, A. F., 45 De Vries, G., 84 de Waard, C., 198, 203, 204, 206 Dewald, J. F., 155, 158, 173 Dewald, R. E., 22 Dewar, M. J. S., 270, 509, 514 de Wette, F. W., 105 De Wit, G. A., 501 DeWitt, H. E., 411 Dexter, D. L., 331, 332 Dheer, P. N., 102, 103 Diamond, R. M., 471 Diatkina, M., 204 Diaz-Peña, M., 70 Di Cianni, N., 227, 237 Diebler, H., 16 Dieckmann, M., 375 Diehl, P., 513, 521 Diemer, J., 387 Diemer, J., 387 Dücker, K.-H., 473 Diepen, G. A. M., 77, 78, 366 Dudek, G. O., 518, 520

Dietrich, M. W., 520 Dimroth, K., 372 Diorio, A. F., 430, 438, 439, 442, 443, 444, 445 Disch, R. L., 65 Distèche, A., 358 Dittmer, D. C., 510 Diven, W. F., 26 Dixon, J. A., 501 Dixon, R. N., 463 Dixon, R. S., 22 Dixon, W. B., 244 Dixon, W. T., 210 Djerassi, C., 281, 516 Dmuchovsky, B., 143 Dobrov, W. I., 200 Dobyns, V., 231 Dodd, R. E., 244 Dode, M., 72, 74 Dodgen, H. W., 19 Dodson, R. W., 159 Dogonadze, R. R., 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 168, 169, 170, 171, 172, 173, 174, 175, 177, 179, 183, 184, 185 Dokukina, E. S., 145 Dole, M., 455 Dolejšek, Z., 137 Domb, C., 415 Donath, W. E., 268, 271 Donnay, G., 322 Donnelly, R. J., 263 Doorenbos, H. E., 206 Doran, D. G., 361 Doran, M. A., 513 D'Orazio, L. A., 68 Dorfman, L. M., 22 Dorough, G., 343 Dörr, F., 24 Doty, P., 379, 380, 381, 383, 385, 387, 388 Douglas, B. E., 308 Douglass, D. C., 496, 499, 508, 520 Douslin, D. R., 65, 452, 453, 454 Douzou, P., 216 Dove, W. F., 383, 385 Dowling, J. M., 245 Downey, J. W., 128 Downing, M., 383 Downs, G. W., 461, 462 Drago, R. S., 494, 505 Dreeskamp, H., 505 Dreizler, H., 232, 240 Dremin, A. N., 361 Drickamer, H. G., 349, 357, 362, 364, 365 Drowart, J., 461 Drury, J. S., 520 Dubbel, D., 143 Dubois, J. T., 23 Dubuisson, M., 358

Dugdale, J. S., 98 Dulbecco, R., 373 Dulz, G., 17, 165, 175, 190, 191 Dumitru, E. T., 430, 436 Dunsmore, H. S., 472 Duparc, D. M., 271 Dutler, H., 340 Duval, E., 492 Duvall, G. E., 360 Duwez, P., 125 Duysens, L. N. M., 312 314, 315, 321, 334, 335, 337, 338, 339 Dvorak, K., 72, 76 Dye, J. L., 22, 471 Dyer, J., 507 Dzis'ko, V. A., 147, 150

Eaborn, C., 145 Eager, R. L., 213 Eargle, D. H., Jr., 209, 210 Eastham, A. M., 520 Eastman, E. D., 478 Eastman, P. C., 208 Eaton, D. R., 514, 518 Ebbing, D. D., 252, 254, 259, 266 Ebersole, S. J., 507 Ebner, G., 429 Ebsworth, E. A. V., 506, 512 Eckehaut, Z., 503 Edel'shtein, V. M., 72, 76 Edeskuty, F. J., 86, 88, 98 Edlén, B., 259 Edmister, W. C., 71, 76 Edmiston, C., 262, 263, 267 Edsall, J. T., 16 Edwards, A. E., 72, 75 Edwards, D. O., 83-108; 100, 101, 102, 103, 104, 105 Eggensperger, H., 208 Egorova, T. S., 147 Ehrenstein, G., 245 Ehrlich, G., 132, 133, 141 Ehrlich, P., 364 Eichelberger, R. J., 362 Eigen, M., 13, 22, 25, 26 Eigner, J., 388 Eisch, J. J., 512 Eischens, R. P., 149 Eisenberg, A., 364, 429 Eisenberg, H., 429 Eisenstein, A., 45 Eisinger, J., 502 Eisinger, J. T., 239 El-Bayoumi, M. A., 270 Elias, L., 471 Eliassof, J., 471 Eliasson, R., 383, 387

Eliel, E. L., 520 Elleman, D. D., 496 Ellington, R. T., 66 Elliott, R. P., 12 Ellis, D. E., 263 125 Ellison, F. O., 269, 270 Elmer, T. H., 147 Eloranta, J., 22 El-Sayed, M. F. A., 324, 328, 331, 343 Elston, J., 147, 148 Elvidge, J. A., 508 El'yanov, B. S., 352, 353 Emelianova, V. M., 150 Emerson, M. T., 73, 521 Emerson, R., 311, 314, 318, 320, 337 Emery, V. J., 87, 97 Emmett, P. H., 131, 147 Emsley, J. W., 495 Endicott, J. F., 165, 175, 190 Engel, E. K., 315 Engell, H-J., 131 Englert, F., 415 Englert, G., 510 Epstein, J., 261 Epstein, S. T., 261 Erdahl, R. M., 491 Erickson, B. E., 334 Eriksson, H. A. S., 267 Eriksson, L. E. G., 518 Eringis, K., 262, 266 Ermachenko, V. M., 362 Erman, W. F., 516 Ermolaev, Y. K., 212 Ernst, M. H. J., 402 Ernst, R. R., 489, 490 Ershov, B. G., 213 Ershov, Yu. A., 353 Esbitt, A. S., 236, 244 Essen, L., 241 Esteban, G. L., 462 Ettinger, R., 512 Evans, D. F., 496, 504 Evans, M. G., 350, 352 Evans, M. W., 68
Evans, R. W., 311
Evdokimov, V. B., 136
Evdokinova, V. V., 366 Everett, D. H., 70, 72, 76 Evers, E. C., 470, 480 Evstigneeva, R. P., 216 Ewald, A., 441 Ewald, A. H., 357, 361 Eyges, L., 257 Eyring, E. M., 31 Eyring, H., 31, 45, 46, 49, 53, 54, 55, 155, 157, 161, 176, 183, 186, 284, 287, 306, 309

P

Fahey, R. C., 509, 514 Fainshtein, I. Z., 355 Fairbank, H. A., 85, 86, 88, 94, 98, 101, 105 Fairbank, W. M., 89, 104, 105 Fairbourn, A., 201 Falconer, W. E., 208, 211 Falk, M., 389 Faller, J. G., 126 Fano, U., 405 Farber, M., 459, 460 Farnsworth, H. E., 135 Fasella, P., 26 Faulkner, E. A., 217 FauréFremet, E., 441 Favero, P., 238 Favero, P. G., 225 Fawaz-Estrup, F., 502 Feakins, D., 473 Feder, H. M., 455, 456 Fedorov, V. B., 217 Fedotov, V. N., 199 Feeney, J., 495 Feher, E., 217 Feher, G., 217 Fehsenfeld, F. C., 217 Felcher, G. P., 124 Feldman, U., 146 Felix, D., 55 Felsenfeld, G., 384 Fenrick, H. W., 213 Fensham, P. J., 139 Fernandez, J., 245, 343 Fernando, M. J., 473 Ferraro, J. R., 521 Fessenden, R. W., 22, 202, 210 Feughelman, M., 443 Feynman, R. P., 261, 405 Ficken, G. E., 340 Fielden, E. M., 22 Fiers, W., 373, 383 Fieschi, R., 39, 40 Fiks, V. B., 472 Filseth, S. V., 213 Finaz, A., 492 Fingerland, A., 132 Fischer, G., 208 Fischer, H., 202, 207, 340 Fischer, P. H., 206 Fischer-Hjalmars, I., 270 Fisher, F. H., 359 Fitt, D. D., 301, 390, Fitzgibbon, G. C., 455 Fixman, M., 477 Flanagan, C., 244, 245 Flautt, T. J., 516 Fleischer, E. B., 20 Fleming, J. S., 507, 510 Fleurje, K. H., 205 Flicker, H., 95 Flory, P. J., 422, 423, 425, 426, 427, 428, 430, 431, 432, 434, 435, 436, 438, 440, 441 Flotow, H. E., 455 Flowers, M. C., 461 Fluck, E., 489

Flurry, R. L., 202 Flygare, W. H., 245 Flygare, W. H., 245 Flynn, G. P., 406 Flynn, G. W., 494 Fock, V., 262, 267 Fock, W., 73, 75 Foerster, G. V., 215 Folkers, K., 334 Folman, M., 146, 147 Fontana, P. R., 271 Foote, G. S., 506 Ford, G. W., 34 Ford, J., 404 Ford-Smith, M. H., 165, 175, 190 Fork, D. C., 336, 337 Forman, R. A., 243 Forsen, S., 27, 496, 498, 508, 520 Forslind, E., 484 Förster, Th., 331 Foster, J. M., 262, 263 Foster, R. G., 508 Fowell, P. A., 457 Fowles, G. R., 360 Fox, D., 330, 331 Fox, I. R., 514 Fox, P. G., 135, 136 Fraenkel, G., 506, 520 Fraenkel, G. K., 18, 198, 199, 201, 203, 205, 206, 209, 210, 211 Fraenkel-Conrat, H., 375 Fraga, S., 258, 259, 261, 266 Fraissard, J., 147, 148 France, P. W., 212 Francis, P. G., 64, 65, 75 Franck, E. U., 359 Franck, J., 323, 343 Franck, J. P., 98 Frank, H. S., 68, 110 Frankiss, S. G., 503, 506, 512 Franks, F., 68 Fratiello, A., 15, 520, 521 Fredrickson, D. R., 455 Freed, J. H., 198, 199, 205 Freedman, H. H., 513 Freeguard, G. F., 77 Freeman, A. J., 118, 258 Freeman, P. I., 70, 77 Freeman, R., 491, 498, 508 Frei, K., 505 Frei, Y. F., 321 French, C. M., 472 French, C. S., 311, 314, 315, 320, 321, 322, 334, 335 Frenkel, J., 31, 329 Frennet, A., 133 Fresco, H. R., 385 Fresco, J. R., 372, 383,

Freund, G. H., 212 Friedel, R. A., 515 Friedman, A. S., 37 Friedman, H. L., 411, 472 Frieman, E. A., 397 Friend, J. A., 70 Frilette, V. J., 145 Fripiat, J. J., 146, 147 Frisch, H., 267 Frisch, H. L., 43, 68, 395, 409 Frisch, M. A., 450, 451, 455, 457 Fristrom, R. M., 235 Fritz, H. P., 510 Fritzsche, W., 128 Froese, A., 25, 26 Froese, C., 257 Frohlich, H., 156, 158, 168 Froman, A., 268 Frosch, R. P., 312, 331, 332 Frost, A. A., 259, 265 Frysinger, G. R., 472 Fueki, K., 148 Fueno, T., 269, 270 Fujimori, E., 326, 327 Fujimoto, M., 212 Fujita, N., 206 Fujita, S., 398 Fukuda, E., 407 Fujui, K., 202, 264, 265, 269, 270 Fuller, E. J., 55 Funtikov, A. L., 360 Fuoss, R. M., 358, 469, 470, 471, 480, 483 Futrell, J. H., 260

c

Gabrail, S., 427 Gabriel, J. R., 209 Gagnaire, D., 520 Gaines, A. F., 464 Gaines, D. F., 510, 520 Gaines, J. R., 84, 90 Galitskii, V. M., 97 Galkin, G. A., 147 Gallagher, J. J., 240 Gallagher, W. P., 514 Gallard, J., 145 Galliland, A. A., 458 Galwey, A. K., 136, 137, 142 Gambhir, R. S., 64 Gambling, W. A., 217 Gammel, J. L., 84, 88, 90 Gandel'man, G. M., 362 Ganyuk, L. N., 149 Garbisch, E. W., Jr., 520 García de la Banda, J. F., 140 Gardiner, 217 Gardner, D. M., 453

Gardner, R. A., 148 Gardner, R. S., 373 Garif'yanov, N. S., 199, 201, 206 Garikian, G., 48, 49 Garner, C. S., 191 Garnett, J. L., 144 Garwin, R. L., 90, 104 Gastuche, M. C., 147 Gatlin, L., 376 Gault, F. G., 133, 134, 142 Gauthier, H., 521 Gaven, J. V., Jr., 407, 502 Gaydon, A. G., 460 Gebbie, H. A., 365 Gee, G., 431 Geele, E. J., 205 Geiderikh, M. A., 145 Geiduschek, E. P., 373, 383, 387 Geier, G., 21 Geiger, F. E., 239 Geller, M., 259, 267 Geller, S., 121 Gent, A. N., 434 Gent, M., 68 George, A., 453, 454 George, P., 155, 157, 165 Gerdanian, P., 455 Gerdil, R., 210 Gere, E. A., 216 Gerischer, H., 155, 158, 161, 162, 174, 179 Germer, L. H., 134 Gerngross, O., 438 Gersch, H. A., 33, 412 Gerson, F., 206 Gestblom, B., 496, 498 Geus, J. W., 135, 136 Ghersini, G., 140 Giacometi, G., 202, 203 Gibbons, B. H., 16 Gibbs, J. H., 387 Gibbs, S. P., 315, 316 Gibson, R. O., 351 Gilbert, T. L., 258, 263, 267 Gill, S. J., 383 Gillespie, R. J., 262, 495, 501, 503, 518 Gillies, D. G., 514 Gimarc, B. M., 265 Gingrich, N. S., 45 Ginn, S. G. W., 72, 74 Gioumousis, G., 499 Giulotto, L., 501 Gjaldbaek, J. Chr., 67 Gjertsen, L., 193 Gladney, H. M., 268, 270 Glarum, S. H., 204 Glasstone, S., 161 Glaubiger, D. L., 374 Glazunov, F. Ya, 213 Glitz, D. G., 383 Goates, J. R., 71, 72

Gobeli, G. W., 146 Goedheer, J. C., 326 Gold, L. P., 239, 240, 259 Gold, V., 474 Golden, S., 237 Goldman, K., 66 Goldstein, J. H., 377, 495, 507, 510, 516, 517 Goldstein, L., 101, 105 Goldstone, J., 254, 267 Golebiewski, A., 263 Gomatos, P. J., 373 Gombás, P., 257 Gomer, R., 132 Gomez-Bañez, J. D., 69 Gonikberg, M. G., 349, 351, 352, 353, 354, 355, 364 Good, W. D., 452, 453, 454, 455, 464 Goodenough, J. B., 115 Goodisman, J., 261 Goodkind, J. M., 104, 105 Goodman, L., 270, 514
Gordon, J. A., 383
Gordon, M., 68
Gordon, S., 21, 22
Gordy, W., 208, 239
Gorin, E., 284 Gor'kov, L. P., 97 Gorski, R. A., 72, 75 Gosting, L. J., 479 Goto, R., 209 Gottlieb, H. B., 457 Gough, J., 421 Gourary, B. S., 481 Gouterman, M., 214, 215, 340, 341, 342, 343 Govindjee, 314 Gow, J. S., 461, 462 Gowenlock, B. G., 462 Grad, H., 402
Graham, J. R., Jr., 217
Graham, D. M., 494
Graham, J. R., 314
Graham, M. J., 133 Granick, S., 316 Grant, D. M., 489-528; 495, 504, 507, 509, 515, 517 Gratzer, W. B., 379, 380, 381 Graziosi, F., 373 Green, G. W., 239 Green, J. W., 460 Green, M. S., 67, 396, 399, 400, 409, 411 Greenbaum, M. A., 459, 460 Greenberg, E., 456 Greenblatt, C. L., 315 Greenler, R. G., 148 Greist, J. H., 381 Grieves, R. B., 66 Griffing, V., 259, 271 Griffith, J., 443 Griffith, J. S., 155, 157, 165 Grigger, J. C., 453 Grilly, E. R., 83, 88, 98, 100, 104, 105 Grisdale, P. J., 514 Griskey, R. E., 66 Griskey, R. G., 66 Gronowitz, S. G., 496 Gross, P., 457 Grossman, L., 383 Grossweiner, L. I., 21, 24 Green, H. S., 31, 34, 36, 40 Greene, F. D., 204, 208 Gribova, Z. P., 216 Grindlay, J., 53 Groeneveld, J., 39, 407 Grube, H., 114, 115, 116 Gruber, H. L., 136 Gruen, L. C., 27 Grunberg-Manago, M., 371 Grüning, W., 430 Grunwald, E., 14, 15, 352, 357, 520 Grzybowski, A. K., 474 Guarnieri, A., 238 Guenault, A. M., 405 Guffy, J. C., 521 Guggenheim, E. A., 63, 70, 71, 72, 75 Guild, W. R., 373, 383 Gundry, H. A., 452, 453 Gunn, S. R., 456, 458 Gupta, S. R., 472, 473 Gurney, R. W., 158 Gürsey, F., 33 Gustavson, K. H., 441 Guthrie, G. B., 452 Gutowsky, H. S., 207, 495, 500, 501, 502, 505, 515, 520, 521 Gwinn, W. D., 225, 230, 233, 242, 245

H

Haake, P., 510
Haase, R., 472, 473, 474, 475, 476
Haber, J., 139
Habgood, H. W., 147
Hach, R. J., 272
Hackimori, Y., 383, 387
Hackleman, W. R., 501
Hadley, L. N., 330
Hafemann, D. R., 411
Hahn, Yu H., 212, 213
Hainsworth, W. R., 358
Hala, E., 72, 75
Hall, G. G., 204, 261, 262, 512
Hall, J. B., 375
Hale, J. D., 474
Hall, J. F., 138
Hall, J. F., 138
Hall, J. L., 328
Hale, J. M., 189
Hall, R. H., 371
Hall, W. F., 461

Hall, W. K., 134, 149 Halliwell, H. F., 481, 482 Halpern, J., 16, 17, 155, 158, 159, 165, 175, 190, 191, 192 Halpern, W., 143, 144 Halpin, J. C., 438, 442, 443 Haly, A. R., 443 Ham, F. S., 204, 217 Hamada, H., 136, 138 Hamaguchi, K., 387 Hamann, S. D., 349-70; 48, 49, 350, 351, 354, 355, 358, 359, 360, 361 Hambeus, E., 443 Hameka, H. F., 214, 260, 265 Hamilton, W. O., 217 Hammarsten, E., 383, 387 Hammel, E. F., 83, 87 Hammes, G. G., 13-30; 19, 25, 26 Hammett, L. P., 352 Hammond, G. S., 15, 520 Hammond, P. R., 506 Hanks, R. V., 406 Hanna, M. W., 73, 509, 521 Hannah, J., 340 Hansen, M., 109 Hansen, R. S., 137 Hansen-Nygaard, L., 244 Hanson, A. L., 213 Happe, J. A., 518 Harcourt, R. D., 265 Harding, R. S. F., 207 Hardisson, A., 204, 512 Hardy, W. N., 499 Hargitay, B., 429 Hartley, S. B., 455, 462 Harned, H. S., 473 Harrick, N. J., 146 Harriman, J. E., 18, 205 Harrington, J. K., 509 Harris, A. P., 352 Harris, F. E., 264, 265 Harris, R. A., 181, 187 Harris, R. K., 494, 495, 503, 520 Harrison, I. T., 516 Harrison, M. C., 264, 270 Hart, A. B., 139, 145 Hart, E. J., 21, 22 Hart, H. R., 93 Hart, R. W., 39, 40 Hartland, A., 407 Hartman, J. S., 520 Hartman, K. A., 389 Hartmann, H., 268, 269 Hartog, F., 143 Harvey, A. F., 241 Haschemeyer, A. E. V., 376 Haselkorn, R., 387 Hastings, J., 116, 123 Hatchard, C. G., 328

Hatton, J. V., 505 Hauck, R. P., 340 Hauge, E. H., 34 Hauk, P., 260 Hauver, G. H., 362 Havinga, E. E., 272 Haxo, F. T., 335 Hayashi, M., 232, 240, 373 Hayashi, M. N., 373 Hayes, F. H., 133 Hayman, C., 457 Haynes, J. M., 133 Hayon, E., 214 Hayward, D. G., 150 Head, A. J., 453, 455 Head, C., 412 Head, E. L., 455 Hearst, J. E., 388, 389 Hecht, H. G., 198, 506 Heffernan, M. L., 265, 270, 495 Heichelheim, H. R., 66 Heidelberg, R. F., 245 Heine, V., 263 Heitz, E., 315 Helfand, E., 43, 45, 68, 395, 412, 415, 477, 478 Helmkamp, G. K., 383, 385, 388 Heltemes, E. C., 99, 102, 103, 104 Hemmer, P. C., 33, 412 Henderson, A. T., 145 Henderson, D., 31-62; 31, 49, 54, 55, 63 Henning, J. C. M., 198, 203, 204, 206 Henriksen, T., 213 Henriksen, Y., 26 Heppel, L. A., 372 Herington, E. F. G., 72, 76 Herman, Z., 137 Hermans, J. J., 69, 70, 426, 483, 484 Hermsen, R. W. 72, 75 Herrmann, H., 291 Herschbach, D. R., 226, 227, 228, 229, 240 Hershey, D., 476 Herskovits, T. T., 383 Hertz, H. G., 484, 489 Herzberg, G., 334 Hetzer, H. B., 474 Heyne, H., 138 Highberger, J. H., 440 Highton, P. J., 373, 374 Higuchi, J., 202, 204, 214, 215 Hijmans, J., 69, 70 Hikino, T., 136, 138 Hildebrand, J. H., 31, 63, 67, 68, 71, 72, 77 Hildebrant, A. F., 210 Hildenbrand, D. L., 460,

Hill, 217 Hill, R., 311, 312, 313, 315, 334, 338 Hill, T. L., 31, 48, 445 Hillier, I., 50, 68 Hills, G. J., 472, 473 Hindman, J. C., 484 Hirai, N., 54, 55 Hiroaka, H., 67, 68, 77 Hiroike, K., 39 Hirota, E., 228, 233, 236, 238 Hirota, K., 144, 148, 149, 205 Hirschfelder, J. O., 31, 34, 45, 46, 48, 50, 51, 64, 65, 66, 261, 262 Hirst, D. M., 201 Hirst, R. C., 495 Ho, C., 16 Hoarau, J., 515 Hoberecht, H., 521 Hobgood, R. T., Jr., 495, 510, 516 Hobson, M. C., 149 Hobson, M. C., Jr., 131, 149 Hoch, G., 323, 337 Hoch, K., 476 Hochstrasser, G., 492 Hochstrasser, R. M., 331 Hodge, A. J., 315 Hodgeson, J. A., 233 Hodgeson, W. G., 209, 210 Hoeve, C. A. J., 422, 425, 426, 427, 428, 434, 444 Hoffman, R. A., 27, 496, 498, 520 Hoffmann, A. K., 145 Hoffmann, E. G., 520 Hoffmann, R., 264, 269, 270 Hoistink, G. J., 216 Hojvat, N. L., 270 Holcomb, D. N., 371-94 Holleman, Th., 66, 69, 70 Holley, C. E., Jr., 455 Holley, R. W., 373 Hollinger, H. B., 403 Hollocher, T. C., 208 Holloway, C. E., 494 Holm, R. H., 518 Holman, A., 217 Holmes, J. R., 514 Holmes, K. C., 440, 444 Holstein, T., 156 Holström, B., 26 Holt, A. S., 321, 322 Holzer, A., 360 Hone, D., 87, 92, 93, 94, 102 Honig, A., 200, 239 Hoogzard, C., 450 Hoover, W. G., 35, 40, 42, 44, 52, 409, 414 Hope, C. S., 68 Hopfield, J. J., 330

Horiuti, J., 133 Horner, R. A., 18, 193, 472 Horning, A. W., 216 Horrex, C., 461, 462 Horrocks, W. D., Jr., 518 Horsfield, A., 213 Hosseini, S. M., 77 Hossenlopp, I. A., 452 Houghton, G., 66 Hovorka, F., 16 Howard, B. B., 73, 259, 521 Howard, J. B., 237 Howden, M. E. H., 506, 516 Hoyland, J. R., 260, 270, 511 Hruska, F., 494, 519 Huang, K., 156, 169 Hubbard, P. S., 200, 500, 501 Hubbard, W. N., 452, 455, 456 Hübel, W., 450 Huber, E. J., Jr., 455 Hudda, F. G., 133 Hudson, G. H., 66 Hudson, K. F., 443 Huff, J. A., 66 Huff, N. T., 269, 270 Huggins, C. M., 73 Hughes, W. E., 209 Hulme, R., 205 Hume-Rothery, W., 110, 113, 125, 128 Hunt, J. P., 19 Huntington, H. B., 362 Hurley, A. C., 255, 267, 268 Hurst, R. P., 49, 50, 261 Hurwitz, J., 371 Hush, N. S., 155, 157, 158 163, 164, 165, 168, 184, 189 Hutchinson, C. A., Jr., 216 Hutchinson, P., 40, 410 Hutton, H. M., 494, 495, 496, 508, 520 Huzinaga, S., 258, 269 Hyde, J. S., 216 Hymers, W. A., 207 Hyne, J. B., 484

I levskaya, N. M., 147 Ignate'va, L. A., 147 Ikenberry, L. D., 407 Ikrina, A., 206 Il'yasov, A. V., 201, 206 Ilyukhin, V. S., 361 Imanov, L. M., 234 Imelik, B., 147, 148 Ingalis, R. B., 22

Ingram, D. J. E., 217

Inman, R. B., 372, 383, 384, 386, 387 [Ontev, M. B., 77 Irish, D. E., 474 [Isenberg, I., 382 [Ishikawa, Y., 118 [Ishizu, K., 205 [Issa, R. M., 146] [Ro, A., 118] [Ro, K., 116, 127] [Ro, S., 340] [Ro, K., 16, 127] [Ro, S., 340] [Ives, D. J. G., 472, 473] [Ives, D. J. G., 472, 473] [Ives, D. J. G., 472, 473] [Iva, W. H., 209] [Iwamasa, R. T., 519] [Iwamura, H., 521] [Izatt, R. M., 474]

J

Jackman, L. M., 340, 512 Jacko, M. G., 463 Jackson, A. H., 519 Jackson, E. A., 404 Jackson, J. A., 518 Jackson, R. H., 230 Jacobs, E. E., 321, 322 Jacobs, G. D., 244, 245 Jacobson, J. D., 32, 37 Jagendorf, A. T., 311, 339 James, H. M., 265 James, M. R., 71, 72 James, W., 124 Jamieson, J., 349, 361, 365 Jan, J. P., 127 Janner, A., 404 Jannin, C., 116, 119 Janssens, P., 51 Jarrett, H. S., 198 Jarvie, A. W., 72, 74 Jayaraman, A., 366
Jeffries, C. D., 200
Jen, M., 234, 244
Jencks, W. P., 384 Jenkins, D. R., 245 Jennings, D. A., 328 Jennings, W. H., 317, 324, 330 Jepsen, D. W., 411 Jesse, R. E., 216 Jessup, R. S., 459 Jezerskis, V., 266 Job, B. E., 244 Joffe, A. F., 192 Johan, G. P., 472 Johannin, P., 66 Johansen, 217 Johns, R. B., 340 Johnson, C. S., Jr., 18, 207, 520 Johnson, F. A., 461 Johnson, H. H., 68 Johnson, H. R., 236 Johnson, J. R., 68, 76 Johnson, L. F., 217, 491

Johnson, M. F. L., 136 Johnson, P. N., 198 Johnson, W. H., 454, 458 Johnson, W. S., 450 Jonassen, H. B., 516 Jones, F. R., 474 Jones, G. A., 261 Jones, H., 112, 113 Jones, I. W., 66 Jones, J. R., 68 Jones, L. L., 253, 261, 262, 283, 285 Jones, M. M., 455 Jones, M. T., 199, 200, 216 Jones, O. W., Jr., 373 Jones, R. A. Y., 489 Jones, R. R. 1., 48 Jones, T. P., 205 Jones, W. H., 355 Jordan, J., 155, 190 Jordan, P. C. H., 269 Jordan, T., 264 Jortner, J., 263, 272, 331, Joseph, N., 145 Josey, A. D., 518 421, 444 Joule, J. P., Jouve, P., 510, 512, 519 Jouve, P., 510, 512, 513 Joy, H. W., 270 Jucys, A., 262, 266 Judge, J. T., 430 Julg, A., 270, 283 Jumper, C. F., 14, 15, 73, 520, 521 Justice, J-C., 471 Juvinall, G. L., 496

## K

Kabanov, P. V. A., 364 Kac, M., 33, 412, 415 Kadanoff, L. P., 400 Kadzhar, C. O., 234 Kaercher, A., 240 Kageyama, Y., 136, 138, 149, 205 Kahalas, S. L., 259, 261, 262, 266 Kahan, F. M., 371 Kaimakov, E. A., 472 Kaiser, E. T., 209, 210 Kaiser, R., 73, 498, 521 Kaldis, E., 140 Kallenbach, N. R., 371 Kamada, M., 20 Kancerevičius, A., 266 Kandalic, G. A., 66 Kanematsu, K., 116, 118 Kangro, W., 473 Kaplan, E. P., 212 Kaplan, F., 510, 520 Kaplan, R., 209 Kapustinskii, A. F., 362 Karabatsos, G. J., 507, 508, 510, 520 Karagounis, G., 146 Kargin, V. A., 364 Kariakeen, N. V., 455

Karipides, A., 308 Karo, A. M., 259 Karplus, M., 201, 202, 203, 261, 263, 264, 508, 514, Sasha, M., 312, 343, 390 Kasha, M., 312, 343, 390 Kashiwagi, M., 202 Kasiwagi, H., 513 Kasper, J. S., 365 Kasuya, T., 232 Katchalsky, A., 424, 425, 428, 429 Kato, H., 265 Katritzky, A. R., 377, 489 Katsura, S., 34, 409 Katz, E., 338 Katz, J. J., 343, 371, 383 Katz, J. L., 331 Katz, L. R., 438 Katz, T. J., 18, 205 Kaufman, L., 365 Kaulgud, M. V., 77 Kauzmann, W., 184, 201, 259, 269, 284, 287, 294, 309 Kavetskis, V. I., 262 Kavtaradze, N. N., 148 Kawasaki, K., 396, 401 Kawatra, M. P., 411 Kay, R. L., 470, 471, 480 Kayama, K., 204, 257, 260, 266, 268, 269, 270 Kayushin, L. P., 216 Kazakova, V. M., 204 Kazanskii, V. B., 149, 150, 212 Kazavchinskii, Ya. Z., 66 Kearns, D. R., 270, 326 Kearns, E. R., 72, 73 Keen, B. E., 96 Keen, N., 208 Keene, J. P., 22 Kehiain, H., 72, 75 Keier, N. P., 140, 145 Keith, C. D., 136 Keller, H., 216 Keller, J. M., 272 Keller, W. E., 83 Kellers, C. F., 102 Kelley, K. K., 455, 458 Kellogg, R. E., 265 Kelly, H. P., 254, 266, 267, 268 Kelly, P. S., 258 Kelly, T. R., 472 Kemball, C., 133, 134, 135, 137, 142, 143, 144 Kendrew, J. C., 441 Kennard, Sister M., 73, 74 Kennedy, G. C., 365, 366 Kenner, G. W., 519 Kenney, C. N., 245 Kenyon, W. O., 459 Kepler, R. G., 328 Kern, C. W., 214, 515

Kerr, E. C., 88 Kerr, J. A., 462 Kestin, J., 66 Kestner, N. R., 252, 256, 257, 265, 268, 271, 272 Keyes, R. W., 357 Keyston, J. R. G., 85, 86, 88 Khalatnikov, I. M., 83, 86, 87, 92, 95, 96, 97 Khokhlova, T. P., 140 Kholmogorov, V., 149, 205, 208 Khorana, H. G., 371, 372, 383 Kibartas, V. V., 262 Kielich, S., 65 Kiessler, G., 126 Kihara, T., 42, 64 Kiiko, I. A., 349 Kikuchi, R., 33, 263 Kikuchi, Y., 228 Kilpatrick, J. E., 231 Kilroe, J. G., 364 Kim, S., 49 Kim, S. K., 406 Kim, Y. W., 212 Kincaid, J. F., 45, 46 King, E. G., 458 King, R. W., 516 Kingston, A. E., 271 Kinsey, J. L., 245 Kirchhoff, W. H., 230 Kirkwood, J. G., 33, 34, 36, 37, 39, 48, 49, 50, 283, 284, 301, 390, 408, 409, 410, 411, 414, 429, 477, 478 Kirtman, B., 235 Kiryanov, V. A., 472 Kiselev, A. V., 131, 147, 148 Kiselev, V. F., 147, 149 Kishimoto, S., 136, 138 Kistiakowsky, G. B., 463 Kistler, S. S., 356 Kit, S., 371 Kitt, Z., 17 Kittel, C., 330 Kittsley, S. L., 78 Kitzinger, C., 385 Kivelson, D., 197-224; 199, 202, 211, 217, 235, 237, 245 Klanberg, F., 19 Klein, G., 33, 36 Klein, M., 34, 40, 67, 409, 410 Klein, M. P., 216, 243, 491 Klein, R., 135 Kleinman, L., 263 Kleinschmidt, A. K., 373 Klier, K., 139 Klement, W., 366 Klemperer, E., 387 Klemperer, W., 240, 259, 261, 262

Klingenberg, M., 335 Klose, G., 494, 512, 516 Klotz, C. E., 68 Klotz, H., 127 Klotz, L. C., 385 Klyne, W., 489 Kneubuhl, F., 204 Knoblauch, D. A., 7 Knobler, C. M., 83 78 Knor, Z., 137 Knox, R. S., 330 Knox, R. S., 380 Knözinger, H., 145 Knutson, C. F., 360 Kobayashi, R., 71, 75 Kobayashi, R., 71, 75 Kobe, K. A., 65, 72, 75 Kobozev, N. I., 136 Koefoed, J., 68, 69, 70 Koehler, J. S., 111 Koehler, W. C., 123, 124 Koenig, E., 207 Koffer, H., 148 Kogan, E. A., 72, 75 Kohen, R. P., 209 Kohen, R. P., 209 Koide, S., 492 Kok, B., 318, 320, 323, 324, 337 Kokes, R. J., 147, 149 Kokko, J. P., 377, 516 Koks, H. L. T., 135 Kolesnikova, A. N., 360 Kolesnikova, R. V., 212 Kolesov, V. P., 457 Kolker, P. L., 207 Kolos, W., 261, 270 Koloskova, N. G., 217 Kologrivov, V. N., 361 Komura, S., 126 Kondo, S., 31 Konecny, J. D., 72, 74 Konstantinov, B. P., 472 Kopchik, R. M., 507 Koppel, D., 414 Kormer, S. B., 360, 361 Kornberg, A., 371, 385 Kornegay, R. L., 508 Korotkov, A. A., 459 Korringa, J., 362, 499 Kortüm, G., 148 Koski, W. S., 206, 212 Koskikallio, J., 356 Kosobutskaya, L. M., 321, 322 Köster, W., 114, 115, 116 Kotani, M., 257, 259, 260, 266, 268, 272 Kotin, L., 386 Kotov, A. G., 211 Kotov, E. I., 149, 205 Kottis, P., 215, 216 Koutecký, J., 132, 271 Kowalewski, D. G., 495 Kowalewski, V. J., 495 Kozyrev, B. M., 197, 199, 200, 206 Kraft, R., 349 Kraitchman, J.,

Kramers, H. C., 85, 86, 88, Krasnovskii, A. A., 321, 322 Kratky, O., 388 Krauss, J. B., 491 Krauss, M., 260, 262, 267, 269 Kreevoy, M. M., 15 Kreglewski, A., 78 Kreiter, C. G., 510 Krentsel', B. A., 145 Kresge, A. J., 521 Kreutz, V. W., 316 Kreutz, W., 316 Krichagina, A., 266 Krichagina, A., 266, 267 Krigas, T. M., 244 Krikorian, O. H., 461 Kriloff, H., 507 Krisher, L., 244, 245 Krishnamurty, K. V., 155 Krishnamurty, V. V. G., 72, 76 Kromhout, R., 321 Kronig, R., 362 Kroto, H. W., 463 Kruerke, U., 450 Kruh, R. F., 412 Krupnikov, K. K., 360 Krylov, N., 397 Krynicki, K., 501 Ku, V., 144 Kubo, R., 407 Kubokawa, Y., 139 Kubota, Y., 121 Kuchaev, V. L., 135 Kucheryavenko, N. S., Kuchitsu, K., 226, 228, 229 Kuczkowski, R. L., 230, 236 Kuhlmann, K., 498, 504 Kuhn, A. T., 474 Kuhn, H. J., 429 Kuhn, W., 291, 429 Kuleshova, L. V., 361 Kul'kova, N. V., 134, 138 Kullnig, R. K., 509 Kummer, D., 495 Kummer, M., 33 Kunze, R. W., 471 Kupke, D. W., 322 Kuriacose, J. C., 140 Kurihara, K., 383, 387 Kurita, Y., 202 Kurland, R. J., 520 Kustin, K., 13, 16, 19 Kutzelnig, W., 262 Kuwata, K., 149, 205 Kuznetsov, V. S., 133 Kylividze, V. I., 147 Kwoh, T., 284 Kwon, J. T., 506 Kyogoku, Y., 378, 379

Lacher, J. R., 457

Lacina, J. L., 453, 454, 455 Laederich, R., 208 Lafleur, S., 33 Lagercrantz, C., 208 Lagerkvist, V., 375 Laidler, K. J., 155, 158, 161, 165, 177, 183, 184, 186 Lamaire, H., 207, 208 LaMar, G. N., 518 Lambert, J. A., 49 Lampe, F. W., 260 Lancaster, J. E., 513 Land, E. J., 24, 207 Landau, L. D., 84, 90, 95, 96 Landau, M. A., 132 Landesmann, A., 104 Lane, B. G., 387 Langen, P., 371 Langenbucher, F. Langemann, A., 340 Langer, S. H., 72, 75, 76 Langer, S. H., 72, 75 Langhans, G. H., 138 Lani, K., 444 La Paglia, S. R., 288 LaPlance, L. A., 520 Laquer, H. L., 95 Larkin, J. A., 70 Larsen, 217 Larsen, H. A., 357 Larsen, S. Y., 411 Larson, W. D., 473 Laszlo, P., 491, 507, 508 Latimer, P., 324, 326, 338 Latimer, W. M., 482 Latremouille, G. A., 520 Laurent, T. C., 383, 387 Laurie, V. W., 226, 227, 228, 229, 231, 233, 236, 240, 245 Lauterbur, P. C., 513, 515, 517 Laves, F., 110, 125 Lawley, K. P., 67 Lawson, A. W., 349 Lax, M., 405 Layzer, D., 257, 268 Lazarus, D., 357 Lazdins, D., 515 Lea, K. R., 42, 67, 122 Leask, M. J., 122 Lebedev, V. P., 136 Lebedev, Ya. S., 198, 208, 217 Lebedev, Yu. A., 455 Lebowitz, J. L., 42, 43, 44, 68, 406, 408, 409, 410, 415 Lecar, H., 245 Lecocq, P., 116, 118, 119, 120 Leder, L. B., 135 Lee, D. M., 88, 94, 98, 102 Lee, S., 213

Lee, T. D., 407, 411 Lefebvre, R., 215, 216, 258 Lefebvre-Brion, H., 259, 261, 266, 272 Leffler, J. E., 357 Leftin, H. P., 131, 149 Legare, R. J., 16 LeGoff, E., 340 Lehn, J., 291 Lehninger, A. L., 339 Lehnsen, J. E., 513 Leigh, J. S., 149 Leimgruber, W., 340 Lemaire, N. A., 406 Lemaire, R., 124 Lemieux, R. U., 520 Lemons, J. F., 518 Lengyel, P., 373 Lenk, R., 202, 203, 204 Lennard-Jones, J. E., 32, 45, 48, 255, 262, 267 Lennox, F. G., 442 le Noble, W. J., 353, 355 LePair, C., 101 Lerman, L. S., 388 Lester, G. R., 471 Leute, V., 145 Levelt, J. M. H., 31, 49, 50 Levesque, D., 34, 40, 42 Levich, V. G., 155, 156, 158, 161, 162, 163, 164, 165, 168, 169, 170, 171, 172, 173, 174, 175, 177, 179, 184, 185, 472 Levin, L. I., 266 Levine, H. B., 267 Levine, L., 383 Levinson, I. B., 266 Levitan, I. O., 285, 306 Lew, H., 239 Lewin, S., 385 Lewinson, V. A., 34, 37, 410 Lewis, C. M., 314 Lewis, D., 72, 74 Lewis, I. C., 514 Lewis, P. H., 136 Li, C. C., 77 Li, N. C., 521 Li, T. T., 430 Libby, W. F., 155, 156, 363 Lichtenthaler, H. K., 317, 319, 320 Lide, D. R., Jr., 225-50; 230, 231, 232, 233, 234, 235, 236, 239, 243, 244, 245 Lieb, E., 408 Lienard, G., 133 Lieser, K. H., 17 Lietzke, M. H., 474 Lifson, S., 386, 387, 424, Lilga, K. T., 212

Lin, C. C., 231, 235 Lin, S. T., 126 Lin, W. C., 204, 213 Lind, J. E., Jr., 470, 471 Lindahl, T., 383, 387 Linder, B., 272 Linderberg, J., 257, 262, 267, 268 Lindner, U., 502 Lindquist, R. H., 150 Lingelbach, R., 116 Linnett, J. W., 201, 255, 262 Linshitz, H., 22, 23, 315, 326 Linstead, R. P., 340 Linton, M., 65, 70 Linzer, M., 245 Lipmann, F., 373 Lipmann, F., 373 Lippert, E., 489, 506 Lippincott, E., 442, 445 Lipschultz, F. P., 102 Lipscomb, W. N., 214, 259, 261, 263, 264, 272 Lipsicas, M., 407 Liquori, A. M., 383 Liss, E., 371 Litovitz, T. A., 356 Littauer, U. Z., 383 Little, L. H., 148 Little, R., 244 Little, W. A., 411 Littler, J., 21 Litvin, E., 355 Liu, C. T., 69 Livingston, R., 23, 147 Lloyd, D. R., 521 Loan, L. D., 68 Loeb, G., 422, 436, 437, 442 Loewenstein, A., 489, 492, 520 Loh, L., 381 Lohr, H. H., 264 Lohr, L. L., Jr., 264, 272 Lombard, D. B., 360 Long, L. H., 455 Longsworth, L. G., 482 Longuet-Higgins, H. C., 33, 68, 199, 210, 269, 271, 341, 400 Longworth, J. W., 382 Lontz, R., 208, 213 Lord, N. W., 198 Lord, P. C. 200 Lord, R. C., 389 Lord Kelvin, 421 Lossing, F. P., 464 Loubser, J., 245 Löustad, R., 26 Low, M. J. D., 149 Löwdin, P. O., 201, 252, 253, 257, 261, 262, 265, 266 Lowe, B. M., 474 Lowe, J. P., 270 Löwenbein, A., 357

Lowenstein, A., 14 Lown, J. W., 205, 520 Lowrey, A., 271 Loy, B. R., 206 Luborsky, S. W., 372, 387 Lucchesi, P. J., 148 Lucken, E. A. C., 201, 210 Luckhurst, G. R., 64, 65 Ludwig, G. W., 217 Ludwig, J. R., 456 Lumbroso, N., 519 Lumry, R., 16 Lunbeck, R. J., 49 Luongo, J. P., 521 Lusgina, V. N., 216 Lussan, C., 521 Luo, H. L., 125 Luz, Z., 14, 15, 520 Lwowski, W., 340 Lygin, V. I., 131, 147, 148, 149 Lykos, P. G., 202, 203, 259, 263, 270, 271 Lynch, V. H., 334 Lynden-Bell, R. M., 216, 495, 504 Lyubarskii, G. D., 138

### ,

Maatman, R W., 145 McAlduff, J. E., McAuley, A., 474 McCaffrey, A. J., 309 McCall, D. W., 499 McCarroll, B., 474 McCartney, E. R., 71 McClellan, A. L., 72, 521 McClintock, R. M., 328 McConnell, H., 217 McConnell, H. M., 159, 200, 205, 216 McCoubrey, J. C., 66, 455 McCourt, F. R., 398 McCoy, C. R., 512 McCrea, J. F., 373 McCullough, J. P., 452, 453, 454, 455, 464 McCully, K. S., 373, 375 McCune, C. C., 356 McCusker, P. A., 73, 74 McDonald, C. C., 210, 245, 518 MacDonald, D. K. C., 405 McDowell, C. A., 197, 204, 206, 213, 270 McElroy, M. B., 261 McGlashan, M. L., 63, 65, 66, 69, 70, 71, 72, 73, 75, 77 McGlynn, S. P., 327, 328 McGreer, D. C., 489 McGuire, D. K., 471 Maciel, G. E., 521 MacInnes, D. A., 358

MacIver, D. S., 150 McKee, D. W., 136, 137 McKelvey, D. R., 356 Mackenzie, J. S., 514 Mackenzie, J. S., McKetta, J. J., 66, 71, 77 McKinnon, I. R., 74 Mackle, H., 454, 457, 464 Mackor, E. L., 198, 199, 203 McKoy, V., 268, 271 McLachlan, A. D., 201, 214 McLauchlan, K. A., 491, 503, 511 McLean, A. D., 258, 259, 261, 263 McLellan, A. G., 37, 42, 53, 54, 55 McLennan, J. A., 400, 402 McMillan, J., 215 McQuarrie, D. A., 49 MacRae, A. U., 134, 136 McTique, P. T., 27 McWeeny, R., 204, 214, 258, 267, 272 McWilliams, A. S., 100, 101, 102, 103, 104, 105 Magee, W. S., Jr., 387 Magnusson, E. A., 264 Mah, A. D., 455 Mahadevappa, D. S., 213 Maher, J. P., 504 Mahler, H. R., 383 Mahler, W., 506 Maire, G., 142 Maitra, K., 26 Maki, A. H., 18, 205, 206, 207, 210, 216 Maksimara, I. N., 259 Malhotra, S. K., 509 Malone, D. P., 217 Mardaleishvili, R. E., 143 Markau, K., 209 Malli, G. L., 257 Mamedova, Yu. G., 145 Manatt, S. L., 496, 507, 510 Mandeles, S., 374 Mandelkern, L., 421-48; 387, 388, 423, 430, 438, 439, 442, 443, 444, 445 Mandel, M., 239 Mandell, L., 377 Mann, D. E., 231, 232, 235 Manson, J. A., 496 Mânsson, M., 454, 455 Marandzheva, E. N., 459 Marantz, S., 456 Marchi, R. P., 54, 55 Marcus, R. A., 155-96: 17, 155, 157, 158, 159, 160, 163, 164, 165, 168, 169, 172, 175, 176, 177, 178, 180, 182, 184, 185, 186, 189, 190 Marcus, R. J., 155, 157, 183, 186

Marcuse, D., 245 Margenau, H., 271 Margosian, F. F., 358 Margrave, J. L., 450, 451, 455, 456, 460, 461 Maricle, D. L., 209 Mark, J. E., 427 Markham, A. E., 72, 75 Markham, R., 375 Marmur, J., 371, 373, 383, 385 Marri, 217 Maroudas, A., 70 Mars, P., 131 Marsh, K. N., 471, 472 Marsh, N. H., 362 Martin, D. B., 383 Martin, D. J., 444 Martin, F. F., 70 Martin, F. F. Martin, G., 505, 521 Martin, J., 521 Martin, J. B., 261 Martin, J. L., 415 Martin, J. S., 513 Martin, M., 521 Martin, P. C., 400 Martynov, A. M., 457 Marucco, F., 455 Maruyama, K., 209 Mason, E. A., 403, 404 Mason, S. F., 285, 290, 291, 304, 309, 390 Massalski, T. B., 110, 125 Massoulie, J., 372 Mat, P., 69 Matevosyan, R. O., 206 Matheson, M. S., 21, 22 Mathews, R. E. F., 371 Mathias, B. T., 121 Mathot, V., 49 Mathur, R., 521 Matsen, F. A., 265, 268, 297 Matsumura, C., 236 Matsumura, O., 206 Matsuo, K., 378, 379 Matsushita, S., 149 Matsuzaki, I., 142 Matthews, P. W., 96 Mattuck, R., 200 Matwiyoff, N. A., 505 Matzner, I., 55 Maun, E., 410 Maun, E. K., 37, 39 Mavel, G., 505 Mayer, J. E., 31, 33, 408 Mayer, M. G., 33 Mayer, S. W., 45 Mayo, R. E., 495 Mazo, R. M., 52, 411, 415 Mazur, P., 406, 415 Mead, C. A., 15 Meath, W., 262 Mecke, R., 512 Meeron, E., 39 Meetham, A. R., 452 Mehra, V. S., 71

Mehrotra, B. D., 383 Meiboom, S., 14, 15, 489, 500 Meier, D. J., 191 Meinwald, J., 508 Meinwald, Y. C., 508 Melhuish, W. H., 24 Melson, G. A., 19 Melvin, I. S., 382 Memory, J. D., 515 Menke, G., 316 Menke, W., 315, 316, 318 Mercer, F. V., 317 Merrifield, R. E., 331 Merts, A. L., 257, 258 Messerly, J. F., 452, 453 Metzger, G., 357 Meyer, E. F., 134, 142, 143 Meyer, H., 88, 98, 90, 91, 92, 101, 102, 103 92, 101, 102, Meyer, L., 263 Meyer, R. B., 27, 520 Meyer, R. T., 245 Meyer, W. L., 27, 520 Meyer, W. T., 442 Michaeli, I., 424, 425, 428 Michaelson, J. D., 209 Michel, A., 116, 119 Michels, A., 406, 412 Michelson, A. M., 371, 372, 374, 384, 388, 389 Middaugh, R. L., 494, 512 Mignotte, P., 72, 74 Mile, B., 18 Miles, H. T., 372, 376, 378, 379, 383 Millen, D. J., 72, 74, 245 Miller, D. G., 475, 479 Miller, J. G., 65, 72, 75 Miller, R. L., 203, 259 Miller, R. S., 373 Miller, R. V., 271
Miller, V. B., 353
Miller, W. B., 510
Miller, W. B. T., 474
Mills, R. L., 88, 97, 98, 100, 104, 105 Milton, D. J., 361 Mironov, A. F., 216 Mirri, A. M., 238 Missen, R. W., 72 Misra, H., 217 Mitchell, T. W., 443 Miyagawa, I., 212 Miyazawa, T., 234 Miyoshi, I., 134 Moccia, R., 260, 262 Mochel, V. D., 505 Moebius, K., 206 Moeck, M. M., 489 Moelwyn-Hughes, E. A., 472 Moffitt, W., 215, 255, 266, 268, 301, 308, 390 Mohling, F., 411 Molin, Yu N., 198, 212, 213 Molinari, E., 140 Möller, K. D., 235 Moller, W., 387 Monaghan, J. J., 34 Monchick, L., 403 Moniz, W. B., 501 Monk, C. B., 68 Monroe, E., 414 Montgomery, C. G., 200 Moohr, J. W., 383 Moore, D. W., 516 Moore, E. B., Jr., 264 Moore, G. E., 140 Moore, J. D., 272 Moore, W. R., 143 Morales, M. F., 429, 434 Moraw, R., 334 Morcom, K. W., 70, 71, 72 Morel, P., 97 Morgan, G. L., 506 Mori, H., 95, 399, 400 Morin, F. J., 192 Morino, Y., 226, 227, 228, 229, 236, 238 Morisawa, S., 375 Morita, T., 39 Morocha, A. K., 200 Morokuma, K., 202, 265 Moroshnichenko, E. A., Morozova, I. D., 201, 204 Morrell, L. M., 19 Morris, D., 239 Morris, E., 360 Mortensen, E. M., 267 Mortimer, C. T., 451, 452, 455, 458, 462 Morton, J. R., 208, 209, 211 Moser, C., 259, 261, 266, 272 Moskowitz, J. W., 263, 264, 269, 270, 271 Mosselman, C., 450 Moszkowski, S. A., Motchane, J. L., 200 Mott, N. F., 112 Moudrianakis, E. N., 373, 374 Moulton, W. G., 209 Mower, E. B., 145 Muchowski, J. M., 507 Muetterties, E. L., 506 Mukherji, A., 261 Mukhtarov, I. A., 234 Mulac, W. A., 21 Mullens, R., 317 Müller, A., 312, 323, 334, 335, 337, 338, 340 Muller, B. H., 500 Muller, E., 208, 209 Müller, E. W., 133 Muller, N., 503, 504, 521

Müller, S., 429
Mulliken, R. S., 258, 259, 264, 269, 270, 271
Mulson, J. F., 133
Muneyuki, R., 506
Münster, A., 31
Muromtsev, V. I., 216
Murray, F. J., 262
Murray, R. W., 215, 216
Murrell, J. N., 206, 263, 291
Musher, J. I., 498, 508, 509
Mushkina, E. V., 77
Myers, A. L., 63, 64
Myers, B. R., 472
Myers, B. B., 72, 76
Myers, H., 155, 158
Myers, J., 314, 315, 339
Myers, R. J., 225, 245

### N

Naas, H., 473 Nachod, F. C., 509 Nachtrieb, N. H., 357 Nagamiya, T., 33 Nagarjunan, T. S., 140 Nagasawa, M., 386 Naiman, A. I., 356, 357 Nakagawa, N., 513 Nakai, Y., 209 Nakajima, A., 422, 427, 436, 437 Nakamura, K., 206 Nakamura, S., 17, 158 Nakamura, Y., 116, 127 Nakata, T., 149 Nalbandyan, A. B., 210 Namikawa, K., 515 Nancollas, G. H., 158, 359, 472, 474 Nanta, W. T., 205 Naphtali, L. M., 136 Napier, K. H., 72, 76 Napper, R., 464 Narath, A., 242, 245 Nardelli, G. F., 501 Nasini, A. G., 135 Nassau, K., 124 Nathans, M. W., 360 Nathans, R., 118 Natta, G., 445 Nazaroff, G. V., 262 Neeman, M., 508 Neff, L. D., 148 Neglia, M. T., 513 Neiding, A. B., 272 Neikam, W. C., 517 Neiman, M. B., 145, 353 Nelson, 217 Nelson, F. A., 490 Nemeth, A. M., 371, 390 Nesbet, R. K., 257, 258, 259, 261, 262, 266, 271, 272 Nesbitt, A. E., 123, 124

Nettleton, R. E., 403 Neugebauer, C. A., 461 Neuman, R. C., Jr., 15, 520 Newham, J., 132, 137, 140, 141 Newman, M. S., 450, 451, 455 Newmark, R. A., 520 Newton, R. C., 365 Nichols, L. D., 464 Nicksic, S. W., 521 Nicol, M. J., 18 Nieman, G. C., 324, 327, 328, 330, 331 Niemiec, J., 128 Nijboer, B. R. A., 39, 40, 42 Nikisha, V. V., 143 Nikitina, O. V., 149 Nirenberg, M. W., 373 Nishimura, H. . 95 Nist, B. J., 508 Nitta, I., 202, 213 Niwa, J., 513 Nobel, A. P. P., 136 Noble, J. D., 500 Nolfi, G. J., 208 Norberg, R. E., 84, 90 Nordberg, M. E., 147 Nordio, P., 202, 203 Nordling, J., 265 Norman, R. O. C., 210 Norris, K. H., 325 Norrish, G. W., 334 Norton, L. J., 128 Nosanow, L. H., 415 Nozieres, P., 97 Nukada, K., 490 Numata, Y., 136, 138 Nurmukhanetov, R. N., 21 Nuttall, R. L., 455 Nyburg, S. C., 481, 482

## -

O'Brien, E. J., 376
Ogibalov, P. M., 349
Ogilvie, R. E., 126
O'Hare, P. A. G., 454
Ohashi, K., 204
Ohlberg, S. M., 430
Ohnishi, M., 490
Ohnishi, M., 490
Ohnishi, S., 202, 213
Ohno, K., 257, 259, 260, 266, 267, 268, 272
Ohoyama, T., 116, 118
Ohrn, Y., 262, 265
Olca, T., 226, 227, 228, 229, 236, 238
Oki, M., 521
Okuda, M., 131
Oleari, L., 260
Ol'khov, O. A., 200
Olson, A. C., 382
Olson, R. A., 311, 315, 317, 324, 330

Olson, W. B., 237 O'Neal, C., 404 Onishi, T., 268 Ono, K., 118 Ono, S., 31 Onsager, L., 415, 469, 470, Opekunov, A. A., 353 Opik, U., 269 Oplatica, A., 428 Oppenheim, I., 37, 396, 399, 401, 404, 405, 406, 409, 411, 415, 499
Orcutt, R. H., 65 O'Reilly, D. E., 150, 200, 501, 520 O'Reilly, J. M., 231, 244 Orgel, L. E., 155, 159, 187 Oriel, P., 304 Orlov, N. F., 145 Ornstein, L. S., 36, 412 Osawa, H., 20 Osawa, Y., 508 Osborn, A. G., 452 Osborn, A. R., 353 Osborne, D. W., 84, 93, 98, 104 Oshina, R., 26 Ostrovskii, I. A., 78 Oth, J. F. M., 422, 427, 430, 432, 436, 438 Ott, J. B., 71, 72 Ottavi, H., 520 Otterstedt, J. E. A., 72 Ourisson, G., 291 Ovenall, D. W., 209 Owen, B. B., 471 Owens, B. B., 45 Ozerova, G. A., 216

D

Paabo, M., 473
Packer, K. J., 504, 512
Padova, J., 482
Page, C. G., 430
Page, F. M., 464
Pais, A., 411
Pake, G., 197, 217
Palitus, J., 271
Paliti, S. R., 77
Palko, A. A., 520
Palmer, T. F., 464
Pankratov, A. V., 458
Pannetier, G., 72, 74
Pao, Yoh-Han, 267
Paoletti, A., 116, 127
Papadopoulos, M. N., 77
Papko, R. A., 208
Papon, P., 499
Paraskevopoulos, G. C., 72
Parfitt, G. D., 471
Pariiskii, G. B., 149, 212
Park, J. D., 457

Park, R. B., 316, 317, 319, 320 Parker, C. A., 328 Parker, F. R., 32, 37, 43, 67 Parr, R. G., 255, 259, 260, 264, 267, 268, 269, 270, 511 Parravano, G., 140 Parson, R., 189 Passari, L., 116, 127 Passchier, A. A., 474 Patapoff, M., 210 Patel, D. J., 506, 516 Patel, J. C., 269 Paterson, W. G., 72, 74, 496, 520, 521 Pathria, R. K., 411 Patterson, D. B., 520 Patterson, D. D., 70 Patterson, J. D., 272 Paul, E. G., 515, 517 Paul, R., 145 Paule, R. C., 461 Pauling, L., 114, 376, 440 Pauncz, R., 271 Pauthenet, R., 124 Pavan, M. V., 202 Pavlovskii, N. M., 361 Pearce, P. J., 359 Pearlstein, R. M., 331, 390 Pearson, D., 359 Pearson, R. Q., 132 Pearson, W. B., 115, 127 Pecherskaia, Iu. I., 150 Pedersen, L. G., 471 Pedley, J. B., 462 Peeling, E. R. A., 145 Peisach, J., 351, 356 Pekar, S. I., 156, 158, 168 Pekeris, C. L., 49, 265 Pell, A. S., 450, 451 Peller, L., 436 Pence, D. T., 236, 245 Penney, W. G., 121 Pennington, F. C., 343 Pennington, R. E., 65 Penniston, J. T., 387 Penrose, O., 408 Peppard, D. F., 521 Percus, J. K., 37, 41, 42, 43, 67, 408, 410, 415 Pereira, A., 383 Perez-Ossorio, R., 451 Perfiloya, I. L., 457 Peri, J., 131-54 Perrin, M. W., 351, 354 Perrin, R., 257, 267 Pershina, E. V., 146 Peshkov, V. P., 83 Peter, B. 240 Peter, R., 240 Peters, D., 263 Peters, G., 210 Petersen, D. H., 244 Petersen, H. L., 459

Peterson, W. R., 363 Petit, P., 213 Petit, R., 217 Petrashen, M., 262, 266, 267 Petrucchi, R. H., 148 Petzow, G., 126 Pfau, C. J., 373 Pfeifer, H., 502 Phil, A., 213 Philippot, J., 51 Phillips, J. C., 263 Phillips, M. J., 144 Phillips, W. D., 216, 510, 518 Phillipson, P. E., 271 Piccirelli, R. A., 396, 399, 411 Pickart, S. J., 118 Piegger, E., 126 Pierce, L., 226, 227, 231, 232, 233, 237, 240, 244, 245 Pierotti, R. A., 68 Piette, L. H., 212 Pikaev, A. K., 213 Pilcher, G., 269, 450, 451, 464 Pimentel, G. C., 72, 73, 272 Pines, H., 142 Pinhey, J. T., 509 Pink, R. C., 149 Piper, T. S., 308 Pippard, A. B., 113 Piskunov, A. K., 216 Pistorius, C. W. F. T., 366 Pistorius, M. C., 366 Pitaevski, L. P., 97 Pitts, E., 470, 471
Pittser, K. S., 231, 234, 256, 264, 271, 272
Pitzer, R. M., 214, 259, 261, 263 Plane, R. A., 474
Platt, J. R., 341
Pliskin, W. A., 149
Pluvinage, P., 265
Pode, L., 39, 40 Podsobliaev, A. P., 213 Poirier, J. C., 42, 409 Polanyi, M., 350, 352 Polinski, L. M., 136 Polkovnikov, B. D., 145 Polo, S. R., 237 Pommier, J., 520 Pon, N. G., 316, 317, 319, 320 Ponec, V., 137 Poole, C. P., Jr., 150 Pooley, D., 216 Pope, A. E., 450, 451, 455, 457 Pople, J. A., 51, 67, 255, 262, 267, 491, 514, 516

Popov, A. G., 143 Porod, G., 388 Porte, A. L., 515 Porter, G., 23, 24, 207, 334 Porter, H. K., 311 Posner, A. S., 430, 438, 439, 442, 443, 444 Potshusta, R. D., 264 Potter, D. J. B., 65, 66 Potter, N. D., 460 Poupko, J.-P., 77 Power, D. V., 360 Powles, J. G., 200, 490, 499, 501 Poynter, R. L., 242 Prados, J. W., 476 Prager, S., 256, 472 Prat, H., 63, 449 Prater, C. D., 131 Pratt, G. W., 257 Pratt, J. N., 461 Prausnitz, J. M., 63, 64, 72, 74, 75, 76, 77 Prelog, V., 264 Premuzic, E., 520 Present, R. D., 271 Preuss, H., 269 Prevorsek, D. C., 430 Price, E., 514 Price, S. J. W., 463 Prigge, H., 506 Prigogine, I., 31, 33, 36, 48, 49, 51, 70, 77, 398, 399, 402 Primakoff, H., 100, 101, 102, 405 Primas, H., 262, 489, 490, 493 Prince, R. H., 208, 521 Prins, R., 216 Prins, W., 422, 427 Pristupa, A. I., 213, 216 Pritchard, G., 461 Pritchard, H. O., 461 Pritchard, J., 134 Privalova, N. M., 458 Prokhorov, A. M., 217 Prokhorova, N. I., 355 Prophet, H., 463 Prosser, F., 514 Provotorov, B. N., 200, 201 Prue, J. E., 472 Pruitt, M. E., 471 Pshezhetskii, S. Ya, 211 Ptak, M., 216 Pullman, A., 269, 271 Pullman, B., 269 Purdie, N., 17, 165, 175, 190, 191 Purnell, J. H., 72, 75, 76 Pyror, M. G. M., 430, 437

Q

Quade, C. R., 235

Quail, J. W., 495, 501, 518 Quinn, C. M., 134

E

Rabani, J., 21, 22 Rabinovich, I. B., 455 Rabinowitch, E., 314, 317, 324, 326, 338 Rabinowitch, E. I., 311, 320, 331 Rader, C. P., 144 Radford, H. E., 245 ., 258 Raimondi, D. I Raja, J. B., 207 Ralph, R. K., 372 Ramachaudran, G. N., 440 Ramel, A., 429 Ramey, K. C., 520 Ramsay, D. A., 334 Ramsey, J. B., 484 Ramsey, W. H., 363 Randall, E. W., 490, 496, 514 Randic, M., 263 Randles, J. E. B., 155, 156 Ranft, J., 495, 505 Ransil, B. J., 258, 259, 261, 263, 266 Rao, B. D. N., 496 Rao, V. M., 233 Raphaelian, L., Rase, H. W., 138 Raskin, Sh. Sh., 146 Rassat, A., 207, 208 Rastogi, R. P., 72, 73 Rastrup-Andersen, J., 244 Rathjens, G. W., 245 Ratka, J. S., 507, 510 Raub, E., 128 Raulier, S., 48 Rauss-Godineau, J., 142 Ravet, A. M., 208 Rawitscher, M. A., 372 Ray, W. J., Jr., 373 Raynor, G. V., 110, 113, 114, 125 Razuvaev, G. A., 455 Reardon, G. V., 422, 430, 441 Rector, C.W., 341 Reddy, G. S., 507, 510, 516, 517 Rèdei, L. B., 110, 204, 261 Redlich, O., 66 Ree, F. H., 35, 40, 42, 44 Ree, T., 54, 55 Reed, R. D., 49 Reed, R. L., 461 Reed, T. M., 63, 66 Reedy, K. C., 77 Rees, M. W., 375 Reese, W., 85, 86, 87, 88, 89, 90, 92, 93, 100, 101, 102 Reeves, C. M., 270

Reeves, L. W., 67, 505, 506, 520, 521 Reich, H. A., 90, 104, 105 Reid, C. E., 262 Reilly, C. A., 498 Reilly, D. E., 21 Rein, R. H., 455 Reinen, D., 136 Reinmuth, W. H., 203, 205 Reiss, H., 43, 45, 68, 409 Remko, J. R., 215 Resibois, P., 133, 398 Retcofsky, H. L., 515 Rethmeier, B. C., 52 Reuben, J., 510 Revina, A. A., 212, 213 Rexroad, H. N., 212, 213 Reynolds, W. F., 513, 517, 520 Ricca, F., 135 Ricci, R., 24 Rice, S. A., 31, 72, 76, 263, 272, 326, 331, 390, 395, 407, 458 Rice, W. E., 374 Rich, A., 376, 440 Richards, E. G., 385 Richards, P. M., 86, 90, 500 Richards, R. E., 217, 489, 520 Richardson, J. W., 259 Rieger, P. H., 203, 205, 206, 209, 211 Rienäcker, G., 131 Riggleman, B. M., 362 Riggs, N. V., 495 Ringold, H. J., 509 Riseman, J., 429 Rivers, J. E., 88, 98 Rivkind, A. I., 200 Roberts, D. E., 430, 438, 439 Roberts, J. D., 269, 489, 504, 506, 507, 516, 520 Roberts, L. R., 71 Roberts, M. W., 134, 135, 137 Roberts, R. W., 136, 137 Roberts, T. R., 84, 95 Robertson, H. P., 182 Robinson, F. N. H., 491 Robinson, G. W., 312, 321, 324, 327, 328, 330, 331, 332, 343 Robinson, P. D., 261 Robinson, R. A., 471, 473, 474, 482 Robinson, R. H., 473 Robinson, R. L., 76 Robison, M., 373 Rocher, J., 213 Rodriguez, A. E., 39 Roe, R. J., 68 Rogers, M. T., 512, 520 Roginskii, S. Z., 145 Rohrbach, R., 430

Ron, A., 147 Rooney, J. J., 133, 134, 142, 143, 149 Roos, H., 520 Root, G. N., 490 Roothaan, C. C. J., 256, 257, 258, 261, 268, 270 Rootsaert, W. J. M., 133, 135 Rosa, E., 381 Röschel, E., 128 Roscoe, J., 496 Rose, A., 72 Rose, P. I., 521 Rosenberg, B. H., 371 Rosenberg, J. L., 323, 343 Rosenblocm, J., 388 Rosenthal, D., 473 Roseveare, W. E., 72, 75 Ross, J., 399, 406 Ross, P. D., 26, 372, 385, 386 Ross, R. A., 139, 145 Rosseinsky, D. R., 18 Rossini, F. D., 450 Rostoker, W., 125 Rotenberg, A., 37 Roult, G., 124 Rowlands, J. R., 212 Rowley, H. J., 358 Rowlinson, J. S., 31, 34, 43, 53, 66, 67, 70, 77, 78, 410 Roy, R., 366 Royce, E. B., 217 Royen, P., 138 Rozantzev, E. G., 145, 208 Ruben, G. C., 521 Rubin, E., 406 Rubtsova, L. F., 145 Rudall, K. M., 440 Ruedenberg, K., 262, 263, 272 Rudin, V. Ya., 72, 75 Rudner, R., 371 Rudolph, H. D., 232, 238, 242 Rudzitis, E., 456 Ruelle, D., 407, 408 Rugheimer, J. H., 501 Rukhadze, E. G., 145 Rumberg, B., 312, 323, 335, 337, 338, 340 Rundel, W., 209 Rundle, R. E., 272 Rushbrooke, G. S., 31, 39, 40, 42, 67, 409, 410 Rushizky, G. H., 372 Rusk, J. R., 239 Russell, G. A., 205 Rüst, P., 375 Rutenberg, A. C., 510, Ryabov, E. N., 458

Ryzhkov, E. M., 471

S Sacher, E., 155, 158, 165, 177, 183, 184, 186 Sachs, L. M., 257, 258 Sachs, T., 16 Sachtler, W. M. H., 133, 135 Sackman, J. F., 455 Sackmann, E., 503, 505 Sadovnichaya, L. P., 471 Sahlin, H. L., 40, 42, 43, 400 Saini, G., 135 Saito, E., 133 Saito, K., 20 Saito, S., 228 Saito, Y., 127 Sakaguchi, M., 134 Sakai, T., 148 Sakharov, M. M., 145 Saleh, J. M., 135, 137 Salem, L., 261, 272 Salinger, G. L., 85, 86, 87, 88, 94, 101 Salinger, R. M., 520 Sallé, R., 145 Salsburg, Z. W., 33, 36, 48, 49, 50, 52, 77, 408, 414, 415 Salzberg, A. M., 472 Samara, G. A., 362 Samejima, T., 382 Samsonov, O. A., 72, 74 Samuel, D., 510 Sandeen, G., 384 Sandel, V. R., 513 Sander, C., 372, 383, 385, 386, 387, 388 Sanders, J. H., 492 Sanders, J. V., 133 Sandlin, G., 412 Sandomirskii, V. B., 133 Sandri, G., 396, 397 Sane, K. V., 198 Sanner, T., 213 Santos-Veiga, J. dos, 199, 203, 205, 206, 207 Sarachman, T. N., 231, 234, 235, 236 Sargent, F. P., 205, 208 Sarkanen, K., 315, 326 Sarnat, M., 373 Sarwinski, R. J., 87, 93 Sasaki, F., 257 Sasson, M., 492 Sastri, M. V. C., 140 Sastry, K. L. V. N., 233 Sather, N. F., 403 Saturno, A. F., 260, 270 Sauer, J., 340 Saunders, E. M., 99, 102 Saunders, M., 27, 520 Saupe, A., 510 Savitsky, G. B., 515 Saxena, S. C., 64 Saylor, G. P., 434

Sazonova, I. S., 140 Scanlon, W. W., 110 Scargle, J. D., 265 Scatchard, G., 71 Schacher, G. E., 21, 501, 520 Schaefer, T., 494, 495, 496, 508, 513, 517, 519, 520 Schaeffer, R., 510 Schaefgen, J. R., 422, 425 Schaller, H., 371, 372 Schawlow, A. L., 225 Scheffler, K., 208, 209 Scheinblatt, M., 15 Schellman, J. A., 304, 436 Scheraga, H. A., 387, 388, 422, 436, 437, 442 Scherr, C. W., 268 Schiff, H. I., 461, 471 Schildkraut, C., 388 Schlapp, R., 121 Schleyer, P. von R., 72, 74, 491, 507, 508 Schmeising, H. N., 203, 263 Schmid, E. D., 512 Schmidbaur, H., 505 Schmidt, H., 357 Schmidt, P. W., 415 Schmidt, U., 209 Schmidt-Mende, P. 323, 335, 337, 338, 340 Schmutzler, R., 506 Schneider, A., 127 Schneider, B., 271 Schneider, G., 77, 78 Schneider, F., 206 Schneider, W. G., 505, 513 Schnepp, O., 147, 330, 331 Schoffa, G., 217 Scholten, J. J. F., 1 Scholtus, N. A., 134 131 Schönert, H., 476 Schonfeld, Ch., 146 Schonherr, M., 458 Schottländer, M., 244 Schrader, D. M., 256 Schreurs, J., 199 Schrieffer, J. R., 97 Schuch, A. F., 98 Schug, D., 21 Schug, J. C., 201 Schug, K., 520 Schugar, H. J., 356 Schuler, R. H., 22, 202, 210 Schultz, D. A., 460 Schultz, T. D., 156, 415 Schumaker, V. N., 388 Schwab, G.-M., 140, 145 Schwab, O., 24 Schwandt, G., 135 Schwarz, H. A., 22 Schwarzenbach, G., 21

Schwendeman, R. H., 240, 244, 245 Scoins, H. L. 39, 40 Scott, D. W., 452, 453, 454 Scott, P. L., 200 Scott, R. L., 63, 67, 68, 71, 72, 73, 75, 76, 77, 510, 521 Scrocco, E., 259 Searcy, A. W., 460 Sears, P. G., 471 Sederholm, C. H., 520 Seewald, D., 20 Segal, B., 201 Sehon, A. H., 25, 26, 461, 462 Sekhar, R. C., 462 Sellers, P. W., 455, 458 Selvaratnum, M., 472 Selwood, P. W., 131, 135, 136, 137 Semenov, A. G., 217 Sengers, J. V., 406 Senkin, J., 349 Sergeeva, Z. I., 145 Servant, R., 213 Servis, K. L., 507 Servos-Garvin, P., 207, 208 Sessler, A. M., 97, 267 Settle, J. L., 455 Severne, G., 402 Severne, G., 402 Sewell, G. L., 156 Shain, S. A., 72, 76 Sham, L. J., 263 Shamshev, V. N., 213, 216 Shankland, D. G., 97 Shannon, P. T., 77 Shapiro, B. L., 507, 510 Shapiro, H. S., 371, 375 Sharma, C. S., 257, 267, 270 Sharma, M. M., 16 Sharma, R. D., 216 Shavitt, I., 263, 264 Shchetinin, A. A., 364 Shchukarev, S. A., 457, 458 Sheinblatt, M., 520 Shemyakina, T. S., 458 Sheppard, J. C., 17, 193 Sheppard, N., 520 Sheppard, W. A., 514, 518 Sher, A., 405 Sherfey, J. M., 476 Sheridan, J., 244, 245 Sherman, R. H., 86, 88, 98 Sherwood, R. C., 123, 124 Shiao, D., 452 Shibata, K., 322, 383, 387 Shida, S., 205 Shields, L., 214 Shigorin, D. N., 211, 216 Shikazono, N., 116, 126, 127 Shimanouchi, T., 378, 379

Shimizu, T., 245 Shimoda, K., 245 Shimomura, K., 500 Shine, H. J., 208 Shinjo, J., 116, 127 Shioji, Y., 213 Shirane, G., 116 Shiren, N. S., 200 Shkodin, A. N., 471 Shockley, W., 329 Shoenberg, D., 113 Shoolery, J. N., 73, 484 Shooter, D., 135 Short, M. N., 375 Shtekher, S. M., 457 Shuberth, H., 77 Shuberth, H., 77 Shugar, D., 372 Shuler, K. E., 404 Shuler, L. M., 66 Shull, H., 268 Shulman, L. A., 198 Shulman, R. G., 502 Shunk, C. H., 334 Sidran, M., 240 Siebrand, W., 505 Siegel, S., 143, 144, 231 Siegert, A. J. F., 401 Sigler, P. B., 372, 383 Silberg, L., 207 Silverman, J. N., 268 Silverstein, R. M., 489 Simakov, G. V., 361 Simcox, L. N., 362 Simha, R., 374, 388 Simkovich, G., 138 Simon, F. E., 98 Simon, I., 358 Simonnin, M. P., 510, 512 Simons, J. P., 463 Simpson, W. T., 262, 269, 341, 381 Sinai, J. J., 260 Sinanoğlu, O., 251-80; 251, 252, 253, 254, 255, 256, 257, 261, 262, 263, 264, 265, 266, 267, 268, 270, 271, 272 Singer, B., 375 Singer, J. R., 206 Singer, M. F., 372 Singer, S. J., 25, 383 Singh, G., 510 Singh, I. S., 343 Singh, N. M., 66 Sinitsyn, M. V., 361 Sinityna, Z., 213 Sinsheimer, R. L., 373, 375 Sirounian, V., 257 Sirovich, L., 402 Skidmore, L. C., 360 Skinner, H. A., 449-68; 269, 450, 451, 455, 457, 464 Skolnick, L. P., 126 Skrabek, E. A., 120, 122, 123

Skuratov, S. M., 457, 458 Slater, 257, 259, 261, 263, 264, 265, 266, 267, 269 Slater, J. C., 262, 264, 329 Slichter, C. P., 197, 206 Slie, W. M., 356 Sloan, G. J., 205 Sloczyfiski, J., 139 Small, R. J., 208 Smaller, B., 215, 216 Smirnova, E. K., 458 Smirnova, V. I., 211 Smith, A. L., 471 Smith, D. F., 272 Smith, D. R., 18 Smith, E. B., 42, 67 Smith, F., 71, 72 Smith, F. T., 410 Smith, G. V., 142, 143, 507 Smith, G. W., 505 Smith, H. A., 140, 144 Smith, H. G., 516 Smith, H. W., 264 Smith, I. C. P., 205 Smith, J. H. C., 311, 320, 322 Smith, M. B., 458 Smith, R. A., 72 Smith, W. B., 509 Smith, W. H., 434 Smith, W. MacF., 20 Smolinsky, G., 214, 216 Smoluchowski, R., 111 Smyth, C. P., 27 Snaith, J. W., 443 Snaith, J. W., 443 Snedden, W., 461 Snider, R. F., 398 Snow, R. L., 71, 72 Snowdon, P. N., 479 Snyder, L. C., 214, 270, 340, 342, 508 Sobell, H. M., 376 Sober, H., 372, 383 Soda, T., 97, 98 Sogo, P. B., 330 Sokolov, I. D., 147 Sokolova, N. P., 148 Solbrig, C. W., 66 Sollich, W. A., 144 Solodnikov, S. P., 208 Solomon, I., 147 Solymosi, F., 139 Somayajulu, G. R. Somers, B. G., 521 Sosnovskii, E. N., 458 Sovers, O., 201, 259, 269 Spedding, H., 496, 520 Spencer, J. H., 375 Speyer, J. F., 373 Spiegel, F. X., 128 Spiegelman, S., 373 Spiro, M., 472 Spitsyn, V. I., 213 Sprally, R. D., 272 Springall, H. D., 451

Spurling, T. H., 65 Spurr, O. K., Jr., 422, 427, 430, 436, 441 Squire, D. R., 52 Squires, R. G., 140 Sreedhar, A. K., 85, 86, 88 Srivastava, B. N., 66 Srivastava, I. B., 66 Srivastava, R. D., 472 Stackel, P., 182 Staes, K., 412 Stager, R. A., 362 Stahn, W., 458 Stalica, N. R., 155, 190 Stalkup, F. I., 71, 72, 75 Stanton, R. E., 261, 268 Starck, B., 225 Stauss, H. L., 205 Stearns, M. B., 116, 127 Steeb, J., 126 Steele, R., 443 Steele, W. A., 403, 404, 501 Steele, W. C., 464 Steffensen, G. R., 242 Stehling, F. C., 490 Stein, R. S., 430 Steiner, R. F., 385 Steinfield, J. I., 19 Stejskal, E. O., 492 Stell, G., 39, 40, 42, 67, 408 Stephenson, M. L., 372 Stern, J. H., 474 Sternhell, S., 509 Sternlicht, H., 214, 216, 324, 327, 328, 331 Stevens, A., 371 Stevens, R. M., 261 Stevenson, D., 45, 46 Stewart, A. L., 257, 265, 267 Stewart, B. B., 514 Stewart, E. T., 259 Stewart, R. F., 381 Steyert, W. A., 85, 86, 88, 94, 101 Stiller, M., 311, 339 Stillinger, F. H., 410 Stillinger, F. H., Jr., 45 Stitch, M. L., 239 Stock, R., 77 Stocker, D., 110 Stockmayer, W. H., 388, 389, 407, 502 Stoddart, C. T. H., 72, 76 Stodolsky, M., 373 Stokes, J. M., 471, 473, 474 Stokes, R. H., 470, 471, 473, 474, 482 Stollar, D., 383 Stone, A. J., 204 Stone, E. W., 206, 207, 210 Stone, F. G. A., 464 Stone, F. S., 131, 138, 139,

Stoodley, L. G., 205 Story, P. R., 508 Stoughton, R. W., 474 Stover, B. J., 31 Strain, H. H., 343 Strandberg, M. W. P., 200, 236 Stranks, D. R., 155, 189 Strauch, R., 240 Strauss, H. L., 18 Strauss, W., 358, 359 Strehler, B. L., 326 Strehlow, H., 20, 490 Streitweiser, A., 269 Strelko, V. V., 149 Strel'nikova, Zh. V., 136 Streng, A. G., 78 Streng, L. V., 78 Stripp, K. F., 37, 409 Strockite, T., 262, 266 Strong, H. M., 349 Strong, R. L., 24 Strongin, M., 85, 86, 88 Strotskite, T. D., 262, 266 Strotskite, I. D., 25 Struehr, J., 16 Strubican, V. S., 366 Stryer, L., 340, 342 Stryland, J. C., 66 W. 383 Studier, F. W., 383 Stuewe, C. W., 66 Sturtevant, J. M., 16, 25, 26, 372, 385, 386, 473 Subrahmanyam, S. V., 77 Suchan, H. L., 362 Sueoka, N., 372, 387 Sugano, S., 308 Sudgen, T. M., 245 Suhl, H., 121 Suhr, H., 521 Suhrmann, R., 135, 138 Sukhotin, A. M., 471 Sullivan, P. J., Sr., 212 Sullivan, E., 472 Summitt, R., 512 Suna, A., 391 Sunner, S., 454 Sushentseva, G. M., 140 Sutcliffe, B. T., 204, 267, 270, 272 Stucliffe, L. H., 495 Sutin, N., 17, 20, 155, 157, 158, 165, 175, 178, 184, 189, 190, 191, 192, 193, 399, 402 Suzuki, T., 490 Svegliado, G., 513 Swalen, J. D., 231, 240 Swanson, J. A., 474 Swanson, L. W., 132 Swartz, P., 128 Sweeney, R. F., 72 Sweers, H. E., 337, 338, 339 Swenson, C. A., 99, 102, 103, 104, 349 Swenson, G. W., 21

Swenson, R. J., 399, 402
Switendick, A. C., 264
Syamala Rao, C., 72, 76
Sydoriak, S. G., 84, 88, 95, 98, 100, 105
Sykes, M. F., 415
Symons, M. C. R., 197, 205, 208, 209, 212, 213, 214, 481
Symons, R. H., 375
Synder, E. I., 520
Syrkin, Ya K., 204
Szabo, Z. G., 139
Szász, L., 262, 265, 266, 267, 268
Szer, W., 372
Szwarc, M., 212
Szwarc, M., 461, 462

### T

Taber, A. M., 145 Tachoire, H., 449 Taconis, K. W., 101 Taft, R. W., 514 Tagawa, K., 339 Taginov, I. K., 72, 76 Tai, J. C., 502 Takabatake, T., 134 Takagi, K., 227, 228 Takahasi, H., 33 Takahashi, M., 26 Takahi, H., 209 Takaki, H., 208 Takei, W. J., 116 Takeuchi, M., 490 Takeuchi, T., 134, 138 Takikaga, R., 209 Takuma, H., 245 Talakin, O. G., 458 Taller, R. A., 520 Tamamushi, R., 155, 190 Tamara, K., 133 Tamássy-Lentei, I., 259 Tamm, I., 373 Tanaka, N., 20, 155, 190 Tani, K., 138 Tanida, H., 506 Tanikaga, R., 209 Tank, R., 126 Tanner, D. D., 351, 364 Tapilin, V. M., 132 Tarr, A. M., 461 Taub, I. A., 22 Taube, H., 155, 158, 165, 175, 190, 518 Taylor, E. H., 140 Taylor, H. S., 265, 266, 267 Taylor, J. W., 361 Taylor, R. D., 88 Taylor, W. H., 114
Taylor, W. J., 51 Tazuke, S., 18 Tchirkov, A. K., 206 Teale, S. S., 139 Tebbe, F., 510

Techel, G., 136 Techo, R., 76 Teichner, S. J., 140, 149 Teller, E., 272, 357 Tel'noi, V. I., 455 Temkin, M. I., 134 Temperli, A., 375 Temperley, H. N. V., 35 Templeton, I. M., 127 Tench, A. J., 207, 211 ten Seldam, C. A., 362 Teramoto, E., 401
Teramishi, H., 462
Teratani, S., 138
Terenin, A. N., 149, 205, 325 ter Haar, D., 272 Tewan, P. H., 472 Thacher, H. C., Jr., 50 Thaddeus, P., 245 Theobald, J. G., 200 Thiele, E., 40, 41, 67 Thodos, G., 66, 71 Thomas, D. D., 216 Thomas, D. G., 330 Thomas, J. E., 415 Thomas, J. K., 21, 22 Thomas, J. R., 208 Thomas, L. F., 244, 245 Thomas, M. R., 343 Thomsen, E. S., 67 Thomson, A. L., 90, 91, 92, 101, 102, 103 Thomson, C., 197-224; 211, 215 Thomson, S. J., 138 Thomson, T. R., 55 Thomson, W. W., 315 Thorson, W. R., 271 Thouvenin, Y., 476 Thrush, B. A., 463 Thumm, H., 473 Ticknor, L. B., 71 Tien, H. T., 473 Tiers, G. V. D., 494, 496, 504 Timercv, R. Kh., 199, 200, 201, 502 Timofeeva, L. N., 147 Tinoco, I., Jr., 371-94; 270, 283, 304, 307, 374, 390 Titova, V. A., 72, 75
Tittel, K. F., 492
Tobiason, F. L., 244
Tobolsky, A. V., 430, 434 Tocchini-Valentini, G. P., 373 Todd, P. F., 199, 203, 206, 210 Todd, S. S., 452, 453 Tolkachev, V. A., 212 Tolles, W. M., 230 Tollin, G., 326, 327, 330 Tomasi, J., 259 Tomita, K., 376 Tomita, M., 209

Tompkins, F. C., 135 Tong, L. K. J., 459 Tonks, L., 33, 414 Toohey, A. C., 363 Tooney, N. M., 208 Topchiev, A. V., 145 Topping, G., 245 Tori, K., 506 Torrey, M. D., 257, 258 Townes, C. H., 225, 239 Toya, T., 133, 143 Toyama, O., 139 Tozer, T. N., 209 Trainor, J. T., 512 Trasciatti, M., 383 Traynard, P., 145, 208 Traynham, J. G., 264 Treloard, L. R. G., 421 Trenner, N. R., 334 Trevalion, P. A., 213 Trimm, D. L., 165, 175, 190, 191 Tristram, E. W., 355 Trotman-Dickenson, A. F., 461, 462 Trozzolo, A. M., 215, 216 Trubitsyn, V. P., 362 Trunin, R. F., 360 Trurnit, H. J., 322 Tsang, T., 267 Tsao, M.-S., 110 Tschoegl, N. W., 389 Tsekhanskaya, Yu, V., 77 Tsivenko, V. I., 211 Ts'o, P. O. P., 372, 382, 383, 385, 386, 387, 388 Tsuboi, M., 378, 379 Tsuchida, A., 267
Tsuchimoto, M., 20
Tsujimoto, H. Y., 339 Tsukerman, B. I., 204 Tsvetko, Yu. V., 72, 76 Tuan, D. F., 251-80; 253, 254, 255, 256, 263, 266, 267, 268, 270, 483 Tuck, D. G., 510, 521 Tuck, L. D., 209 Tuddenham, R. F., 359 Tumanov, V. S., 200 Tupikov, V. I., 211 Turberfield, K. C., 492 Turner, J. C. R., 479 Turner, J. J., 512 Turrion, C., 451 Tzalmona, A., 492, 510 Tyler, J. K., 244, 245 Tyrrell, H. J. V., 475, 476, 482

U

Udenfriend, S., 382 Uebersfeld, J., 200 Ueda, S., 209 Ueda, T., 144 Uhara, I., 136, 138 Uhlenbeck, G. E., 33, 34, 396, 403, 411, 412 Ulbricht, T. L. V., 376, 377 Ulinich, F. R., 362 Umeda, K., 133 Umemoto, K., 208 Unni, A. K. R., 471 Unruh, W. P., 200 Untch, K. G., 520 Urlin, V. D., 360 Urry, G., 205, 208 Usacheva, N. F., 199 Uvarov, A. V., 148 Uyeda, N., 133 Uytterhoeven, J., 146

V

Vaidyanathan, V. S., 478 Vala, M. T., Jr., 390 Valenta, Z., 340 Valiev, K. A., 199, 502 Valitova, F. G., 206 van de Klundert, L. J. M., 406 van der Kelen, G. P., 503 Van der Waals, J. H., 69, 70, 215, 216 Van der Werf, C. A., 72, 74 Vanderzee, C. E., 474 Vane, F. M., 507, 508, 510, 520 Van Haren, H. J., 150 Van Hove, L., 33, 39, 40, 42, 398, 407 Van Huff, N. E., 66 van Itterbeck, A., 412 van Kampen, N. G., 405, 412 Van Leeuwen, J. M. J., 39 van Meurs, N., 510 van Niel, C. B., 311 Vanngard, T., 198 van Reijen, L. L., 133, 135, 150 van Rysselberghe, P., 475 van Welie, G. G. A., 77 Van Vleck, J. H., 199, 200 van Voorst, J. D. W., 206, 216 Varsanyi, G. Y., 72, 74 Varshavskaya, N. L., 472 Vasil'ev, V. P., 474 Vasil'kova, I. V., 457, 458 Vassermann, A., 66 Vasudevan, R., 97, 98 Vatter, A. E., 321, 322 Vaughan, J. W., 471 Venkata Rao, C., 72, 76 Venkatamaran, B., 201 Venkattasetty, H. V., 471 Verbeke, O., 412 Verdier, P. H., 498, 510 Vereshchagin, L. F., 366 Verhagen, G., 461

Verlet, L., 34, 39, 40, 42, 43 Vermesse, J., 66 Vernon, F. L., 405 Veselov, M., 262, 266, 267 Vickers, G. D., 496 Vighetto, E., 204 Vignos, H., 98 Vincent, J. S., 216 Vincow, G., 198, 201 Vinetskaya, M. A., 204 Vineyard, G. H., 416 Vinnik, M. I., 521 Vinograd, J., 373, 388, 389 Vizbaraite, J., 262, 266 Vlcek, A. A., 155, 191 Vodar, B., 66, 499 Voet, D., 379, 380, 381 Voevodski, V. V., 212 Vogt, M., 373 Vol'kenshtein, F. F., 133 Vol'Kenshtenin, M. V., 285, 306 Volimar, P. M., 474 Volpp, G. P., 520 Volungis, R. J., 430 Volz, H., 340 von Ehrenstein, G., 373 von Wettstein, D., 315 Vorob'ev, A. F., 458 Voronkov, M. G., 145 Vreeland, J. H., 358 Vysotskii, Z. Z., 149

### W

Waack, R., 513 Wachtel, E., 114, 115, 116 Wackerle, J. W., 361 Waddington, G., 65, 452, 453, 454 Wagner, C., 138 Wagmiere, G. H., 340, 342 Wahba, A. J., 373 Wahl, A. C., 193, 520 Wainwright, T. E., 32, 37, 44, 46, 52, 67, 410 Wake, R. G., 383 Walaas, E., 26 Walnas, E., 26 Walas, O., 26 Waldmann, L., 403 Wallisch, W., 72, 76 Walker, E. J., 105 Walkley, J., 50, 68 Wallace, W. E., 109-30; 120, 121, 122, 123, 124 Walling, C., 351, 357, 363, 354 364 Wallis, R., 39, 40 Walmsley, S. H., 330 Walrafen, G. E., 474 Walsh, P., 265 Walter, J., 284 Walter, J. E., 284, 287, Walters, D. H., 429

Walters, G. K., 89 Wang-Chang, C. S., 403 Ward, J. F., 492 Ward, R. L., 208, 217, 518 Wardale, H. W., 208 Ware, W. R., 23 Waring, A. J., 377 Waring, R. K., 205 Warner, R. C., 372 Warrick, E. L., 430 Wassermann, E., 214, 215, 216 Wassink, E. C., 338 Watanabe, J., 116, 127 Waters, J., 404 Waters, W. A., 207 Watson, K. M., 399 Watson, P., 473 Watson, R. E., 118, 252, 254, 258, 266, 267, 268 Watts, V. S., 507 Watts-Tobin, R. J., 373 Waugh, J. S., 407, 502 Wauk, M. T., 324, 328, 331 Weale, K. E., 352, 363, 364 Weaver, E. C., 340 Webb, G., 144 Weber, A., 434 Weber, H., 434 Weber, P., 316 Webster, D. E., 145 Wedler, G., 135, 138 Weedon, B. C. L., 340 Weger, M., 217 Wehner, U. , 271 Wei, J., 131 Weidler, A. M., 520 Weier, T. E., 315 Weigl, J. W., 342 Weikard, J., 312, 323, 335, 337, 338, 340 Weil, I. A., 198 Weil, J. H., 198 Weil, R., 373 Weimann, G., 371 Weiner, R. F., 212 Weinstock, B., 84, 98, 102 Weinstock, J., 399, 411 Weisblum, B., 373 Weiss, A. W., 258, 261, 265, 266, 267 Weiss, G. H., 404 Weiss, H., 110 Weiss, J., 155, 157, 183 Weiss, J. J., 390 Weiss, R. J., 116 Weiss, S. B., 373, 383 Weissmann, M., 34, 52, 54 Weissman, S., 207 Weissman, S. I., 18, 205, 208, 210, 216 Weisz, P. B., 131, 145

Weitnauer, H., 430 Welber, B., 93 Welker, H., 110 Wells, C. H. J., 23 Wells, E. J., 505, 506 Wells, P. B., 144 Wells, P. R., 508 Wen, W-Y., 68 Wencke, K., 136 Wenderoth, H., 340 Wendt, H., 20 Wendt, R. P., 479 Wentorf, R. H., Jr., 34, 48, 51, 365 Wernick, J. H., 121, 123, 124 Wertheim, M. S., 40, 41, 409 Westheimer, F. H., 356 Weston, B. A., 474 Weston, J. A., 365 Wetlaufer, D. B., 303 Wettermark, G., 24 Whalley, E. W., 353, 356, 364, 365, 482 Wharton, L., 240, 259, 262 Whatley, F. R., 315 Whatley, F. R., 315 Wheatley, J. C., 85, 86, 87, 88, 89, 90, 92, 93, 94, 95, 96, 100, 101, 102 Whewell, C. S., 443 Whiffen, D. H., 202, 212, 213 Whipple, E. B., 498, 510 White, D., 83 White, J. W., 217 White, R. F. M., 489 Whitelaw, J. H., 66 Whitesides, G. M., 504, 520 Whithey, R. J., 356 Whitman, D. R., 493 Whittle, E., 461 Wiberg, K. B., 269, 508 Wichterle, I., 72, 75 Widenlocher, G., 499, 519 Wiebenga, E. H., 272 Wiebes, J., 101 Wiederhorn, N. M., 422, 430, 441 Wiederhorn, S., 362 Wiegand, W. B., 429 Wieher, J., 459 Wiersema, A., 207 Wigner, E. P., 362 Wilhoit, R. C., 452 Wilkins, J. W., 209 Wilkens, R. G., 19 Wilkins, M. H. F., 372 Wilkinson, F., 23 Wilkinson, M. K., 123 Wilks, J., 93, 94, 96 Willard, J. E., 213 Williams, D. H., 516 Williams, E. G., 351 Williams, H. J., 123, 124 Williams, J., 506 Williams, T. H., 520

Williamson, A. G., 63-82; 69, 70, 72, 74, 75 Williamson, K. L., 508 Williamson, S. M., 458, 510 Willis, Y. A., 434, 444 Willix, R. L. S., 17 Wilmshurst, T. H., 217 Wilson, E. B., 225, 230, 231, 236, 237, 244, 245, 261 Wilson, E. G., 263, 272, 458 Wilson, R., 208, 209 Wilson, S. A., 128 Windle, J. J., 207 Winstein, S., 352 Winterbottom, J. M., 144 Wirzing, G., 147 Wisam, R., 207 Wise, S. S., 455, 456 Witonsky, R. J., 65 Witt, H. T., 312, 323, 334, 335, 337, 338, 340 Wittstruck, T. A., 509 Witz, P., 291 Witzel, H., 372 Wobschall, D., 217 Wodtcke, F., 136 Woessner, D. E., 147, 502 Wöhlisch, E., 430 Wolf, D. E., 334 Wolf, E., 458 Wolf, H., 281 Wolf, W. P., 122 Wollan, E. O., 123 Wong, S. C., 217 Wood, D. E., 205 Wood, J. L., 72, 74, 455 Wood, R. H., 68, 474 Wood, W. W., 32, 37, 43, 50, 67, 414 Woodbrey, J. C., 364 Woodhouse, E. J., 510 Woods, H. J., 443 Woods, R. D., 257 Woodward, R. B., 340 Woody, R. W., 304, 390 Woolf, L. A., 479 Wormald, C. J., 65, 75 Woznick, B. J., 260, 263 Wu, T. K., 519 Wyatt, W. F., 72, 74 Wyllie, P. J., 365

Wynne-Jones, W. F. K., 473

V

Yablokov, Yu. V., 206 Yager, W. A., 215, 216 Yagil, G., 26 Yajima, T., 245 Yakushin, F. S., 143 Yamada, F., 520 Yamaguchi, I., 516 Yamaguchi, K., 205 Yamakawa, H., 72, 76 Yamamoto, H., 116, 127 Yamamoto, O., 490 Yamane, T., 372 Yamazaki, M., 259, 261, 266, 272 Yan, K. S., 403 Yanagawa, H., 422, 427 Yanagimoto, S., 138 Yang, C. N., 407, 411 Yang, J. T., 382 Yao, Y. L., 110 Yarborough, L., 71 Yaris, R., 261 Yarwood, A. J., 463 Yarym-Agaev, N. L., 72, 75 Yasukochi, K., 116, 118 Yates, D. J. C., 148 Yates, R. E., 459, 460 Yeager, E., 16 Yevick, G. J., 41, 42, 43, 67, 408 Yhland, M., 208 Ymada, F., 27 Yodzis, P. P., 206 Yonemoto, T., 517 Yonezawa, T., 265 Yoshimasa, K., 378 Yoshimine, M., 258, 268 Yosim, S. J., 45 Young, T. F., 474 Young, V. K., 320, 321 Yu, S.-N., 77 Yuan, E. L., 311 Yulmet'ev, R. M., 502 Yutsis, A. P., 262, 266

Yvon, J., 36

Z

Zagoruchenko, V. A., 66 Zahner, J. C., 349 Zalewski, K., 161, 162, 180, 181, 182 Zaltzman, P., 382 Zamecnik, P. C., 372 Zandstra, P. J., 18, 209 Zarakhani, N. G., 521 Zauli, C., 264 Zeidler, M. D., 484 Zeif, A. P., 132 Zeil, W., 512, 520 Zeides, H., 147 Zel'dovich, Ya. B., 361, 362 Zener, C., 161, 162, 175, 180, 184 Zenkov, I. D., 457 Zercheninov, A. N., 458 Zernicke, F., 36 Zhidomirov, G. M., 149, 198, 212 Zhulin, V. M., 355 Zhuravleva, T. S., 211 Zielen, A. J., 473 Zimm, B. H., 371, 386, 387, 388 Zimmer, H., 510 Zimmerman, G. O., 85, 86, 88 Zimmerman, J. M., 374 Zimmerman, J. R., 147, 502 Zimmerer, R. W., 242 Zinov'eva, K. N., 83, 96 Zinn, J., 245 Zubay, G., 372 Zubov, V. P., 364 Zucker, I. J., 42 Zuliani, G., 238 Zwanzig, R. W., 33, 36, 37, 272, 398, 401, 409 411, 414, 415, 483 Zweig, A., 209, 513 Zwick, M., 424, 425, 429 Zwicker, E. F., 21, 24 Zwicker, U., 128 Zwietering, P., 131, 135, 136, 143 Zwolenik, J. J., 463, 470 Zwolinski, B. J., 155, 157, 183, 186, 450

# SUBJECT INDEX

Acetaldehyde theoretical treatment of, Acetamidinium chloride proton exchange in, 15 Acetic acid acid dissociation of, 15 nuclear magnetic resonance study of hydrogen bonding in, 521 proton transfer in, 15 2-acetonaphthone flash photolysis of, 23 Acetone catalytic decomposition of, 137 hydrogen bonding equilibrium constant with chloroform, 73 hydrogen bonding heats of formation with, 73 hydrogen bonding studies of, 72-73 second virial coefficient for mixtures of, 65 Acetonitrile hydrogen bonding equilibrium constant with chloroform, 73 Raman spectra of thin films of, 146 Acetonitrile-d3 coriolis coupling in, 236 Acetophenone Raman spectra of thin films of, 146 Acetylene carbon 13 nuclear magnetic resonance of, 494 from catalytic decomposition of ethylene, 137 Hartree-Fock calculations for, 259 Acetylenes hydrogenation of, 142 internal rotation in, 233 irradiation of, 211 selective catalysts for the

reduction of, 145
Acetylenic compounds

chemical shifts in, 512

reactions of, 13

reactions with bases

516

Acids

magnetic anisotropies of,

diffusion controlled, 13 Acrylic acid irradiation of, 212 Acrylonitrile nuclear magnetic resonance spectrum of, 495 Activation analysis development of, 4 Activation energy protolysis of substituted amines, 14 Activity coefficients cesium and rubidium fluoride, 473 nucleic acids, 382-83 ADP phosphorylation of, 339 Adsorption low field magnetization techniques to study, 137 Air Joule-Thomson coefficient for, 64 Albumin bovine serum reaction with azo dyes, 25 Alcohols adsorbed on alumina alkoxide formation on, 148 catalytic decomposition of, 137 heat of formation for, 450-51 hydrogen bonding in, 71 hydrogen bonding with esters, 72 nuclear magnetic resonance studies of hydrogen bonding, 521 properties of mixtures of,

principle of congruence for, 68 virial coefficients for, 65-66 solubility of gases in, 67 theoretical calculations concerning, 264 Alkenes adsorption on metal films, 136 from hydrogenation of aromatics, 143 Alkylbenzenes deuterium exchange in, 144 pyrolysis of, 462 Alkyl benzoic acids heats of combustion of, 451-52 Alkyl halides reaction with tertiary amines pressure dependence of, 354 Allenes hydrogenation of, 142 Allyl radicals spin densities of, 201 Alpha particles from polonium, 9 Alumina alcohols adsorbed on alkoxide formation on, 148 as metal support, 135-36 Aluminum Hartree-Fock calculations for, 258 intermetallic compounds of, 114-17 intermetallic compounds with technetium, 128 shock compression of, 360 Aluminum chloride microwave spectrum and structure of, 239 Aluminum fluoride heat of formation of, 455 microwave spectrum and structure of, 239 Aluminum ion theoretical treatment of, 257

reaction with alkyl

halides

n-Alkanes

mixtures of

differing adsorption states

reaction rates in, 193

polymerization of, 363

centrifugal distortion

analysis of, 239

tions in, 361

of, 141

electronegativity and, 111

microwave spectra of, 239

shock induced phase transi-

theoretical dipole moments

Aliphatic compounds

for, 264-65

Alkali halides

Alkanes

Aldehydes

pressure dependence of, 354 Aminoacids aromatic photolysis of, 24 triplet states in, 216 a-aminopolycarboxylic acids nuclear magnetic resonance studies of hydrogen bonding in, 521 Ammonia binding energy of, 267 bond energy of, 456 diffusion of, 66 exchange in nickel amine complexes, 19 from catalytic decomposition of formaldoxime, 145 Hartree-Fock calculation for, 259 irradiation of, 211 microwave study of adsorbed, 146 molecular integrals for, 264 relaxation of metals in. 200 Ammonia positive radicals nitrogen hydrogen electron paramagnetic resonance coupling constants for, 203 Ammonium ion Hartree-Fock calculations for, 260 protolysis of, 14 Anilines nuclear magnetic resonance studies of hydrogen bonding in, 521 photo-oxidation of, 208 Anthracene adsorbed on silica electron paramagnetic resonance spectrum of, 149 triplet states in, first order decay of, 23 Antibodies reaction with hapten, 25 Antiferromagnetism band type, 116 coupling of gadolinium and cobalt to produce, 121 electron paramagnetic resonance spectrum of, 217 Antimony trichloride Raman spectra of thin films of, 146 solvent for producing aromatic positive ions, 205 Argon binary mixtures of, 66

critical opalescence in,

415

Hartree-Fock calculations for, 258 Joule-Thomson coefficient for, 64 liquid equation of state for, 412 solution of gases in, 68 thermal conductance of, 67 407 second virial coefficients for mixtures of, 65 solubility in water, 68 thermal conductance of, 606 viscosity of, 66, 406 Aromatic compounds 52 alkenes from hydrogenation of. 143 Aromatic hydrocarbons energy transfer in the excitation of, 23 Arsenic heat of combustion of, 455 206 Arsine bond energy of, 456 Atomic size importance in formation of intermetallic compounds, 110-11 Atomic susceptibilities table of, 115 Azo dves reaction with albumin, 25 Band theory chemisorption and, 132 Barium heat of combustion of, 455 Barium chloride nonlinearity of, 262 Banes reaction with acids diffusion controlled, 13 Bend bonds lack of validity of, 245 1,2-Benzanthracene aromatic chemical shift data for, 515 Benzene bromination during photolysis of, 24 catalytic decomposition of, 137 hexamethyl cation electron paramagnetic resonance spectrum of, hydrogenation of, 134 Joule-Thomson coefficient for, 65 molecular integrals for, 263 negative ion of

carbon 13 hyperfine split-

ting in electron para-

magnetic resonance

spectrum of, 205 Pariser-Parr-Pople theory for, 270 second virial coefficient for mixtures of, 65 solubility in water, 68 solubility of propane in, solutions of gases in, 68 vapor pressure of cyclopentane mixtures of, 75 Benzene derivitives chemical shifts in, 512-14 Benzoic acid heat of combustion of, 451proton transfer with sodium benzoate, 14 methyl oxonium ion, 15 Renzonitrile Electron paramagnetic resonance spectrum of, microwave spectrum and structure of, 244 Benzophenone triplet states in, 23 Benzylamines pyrolysis of, 462 Benzyı radical spin density of, 204 Beryllium as a neutron source, 9 theoretical calculations for, 252 Beryllium atom theoretical calculations for, 267-68 Biacetyl energy transfer to, 23 Bicycloheptanes proton coupling constants for, 508 strain energy in, 451 Biochemical reactions rate studies for, 25-27 Blamuth intermetallic compounds of, 128 Bismuth telluride heat pumps using, 76 Bitolyl biphenyls electron paramagnetic resonance spectrum of, 205 Bond dissociation energies spectroscopic studies of, 463-64 Bond energies groups and series from periodic table, 456 Bonding evidence against, 245 Bond lengths discussion of, 225-30

carbon-iodine bond radiolysis of, 2 Borate glasses irradiation of, 213 theoretical torsional barrier for, 264 Borazines theoretical calculations concerning, 264 Boron theoretical treatment of, 255 Boron compounds heats of combustion of, 454-55 Boron hydrides theoretical calculations concerning, 264 Bose branches zero sound in liquid helium and, 96 Bragg reflection electrons in metals, 112 Brillouin zones conduction electrons in metals, 112 **Bromide** photolysis of solutions of, 21 Bromine flash photolysis of, 24 reaction with olefins, 27 Bromine-81 nuclear magnetic resonance rate studies using, 21 Bromoform heat of hydrogen bond formation with tetrahydrofuran, 73 **Brownian Motion** transport theory discussion of, 405-6 Butadiene evidence for no rotational isomers of, 234 heat of reaction with diborane, 457 Butadiene derivatives coupling constants for, 509 n-Butanol mixtures with methanol, 70 1-Butene catalytic hydrogenation of, 145 catalytic isomerization of, 145 cyclization of, 353 cis-2-Butane from hydrogenation of dimethyl acetylene, 142 **Butenoic** acids hydrogenation of, 138 t-Butyl alcohol adsorbed infrared study of,

148

from decomposition of t-butyl hydrogen peroxide, 145 Butyl bromide pyridine reaction pressure dependence of, 353 t-butyl chloride dehydrochlorination of, 138 t-butyl hydrogen peroxide catalytic decomposition of, 145 t-butyl ketone reaction with hydroxylamine, 355 Butyl lithium heat of combustion of, 455 C<sub>2</sub>, C<sub>3</sub>, C<sub>4</sub> Hartree-Fock calculations for, 259 Cadmium shock compression of, 360 Cadmium sulfate Soret coefficient for, 476 Cadmium Sulfide weakly coupled exciton "hopping" in, 330 Calcium chlorate activity coefficient for, 474 Calcium fluoride heat of sublimation of, 460 Calorimetry accurate exothermic measurements with, 76 heat of ionization of water measured, 474 measurement of heats of dilution, 474 micro, 63 rotating bomb, 449 semi-micro aneroid, 457 thermoelectric cooling for, 76 Carbides effusion studies of, 460 Carbon metallic, 363 theoretical treatment of, 255-57 Carbon-13 Chemical shifts for, 513-15 hyperfine electron paramagnetic resonance splitting from, 205 nuclear magnetic resonance study of, 494-95, 497 proton coupling constants for, 504-6 Carbon-14 dating with, 5 discovery of, 1, 11 Carbonate ion magnetic anisotropy in,

516

Carbon-carbon bund magnetic anisotropy of, 517 Carbon dioxide adsorption on metals and metal oxides, 148-49 adsorption on nickel films, 134 average structure for, 227 equation of state for, 66 Hartree-Fock calculations for, 259 hydration of, 16 quadrupole moment for, 65 viscosity of, 66 Carbon disulfide average structure for, 227 polymerization of, 364 Carbon fluorine bond pi character of, 514 Carbon Hydrogen bond magnetic anisotropy of, 517 Carbonium ions theoretical calculations concerning, 264 Carbon monoxide adsorption on metal oxides, 148-49 metals, 148-49 nickel, 134 platinum, 135 tungsten, 135 binary mixtures of, 66 diffusion of, 66 from decomposition of formaldoxime, 145 Hartree-Fock calculations for, 259 isotopic adsorption studies, 138 quadrupole moment of, 65 Carbon tetrachloride alcohol solutions of, 71 heat of mixing with dioxane, 74 mixtures with chloroform, solution of gases in, 68 nuclear magnetic resonance spectrum of, 501 Carboranes theoretical calculations for, 264 Carboxylic acids dissociation constants of, 474 Carnot cycle thermoelastic equivalent of, 429 Carotenoids as photosynthesis pigments, 320 Catalysis acid flash photolysis and, 24 acid-base, 14

28

C2N2

Cobalt

Complexes

Compressibility

solid helium, 3

optical rotation in, 307-9

hydration reactions, 16 organic semiconductors from high polymers, 145 Catalytic decomposition organic compounds on metal surfaces, 136-37 Catechol amine reaction with ceruloplasmin, 26 Cells non-isothermal thermodynamics of, 476 Cerium intermetallic compounds of, 120 Ceruloplasmin reaction with catechol amine, 26 Cesium fluoride activity and osmotic coefficient for, 473 Cesium monoiodide electronegativity in, 111 Hartree-Fock calculations for, 259 CH2, CH3 theoretical spin-spin coupling constants for, 506 Charge transfer halocarbons and electron donors and, 74 incomplete magnesium-lead compounds, 111 photosynthesis and, 313 vinyl silane chemical shifts and, 512 Chemical shift pressure dependence of, 366, 519 theoretical approach, 511-12 Chemisorption band theory for, 132 on supported metals, 135-36 on unsupported metals, 133-35 reactions of adsorbed molecules, 136-38 theory of, 132-33 Chichibabin's hydrocarbon electron paramagnetic resonance study of, 205 Chlorates heats of dilution of, 474 Chloride ions photolysis of solutions of, 21 Chlorine free radicals containing. 207 Hartree-Fock calculations for, 258 Chlorine dioxide microwave spectroscopic

study of, 245

Chloroform Compressibility of mixtures complexes with ether, 74 heat of hydrogen bond formation with tetrahydrofuran, 73 hydrogen bond equilibrium constants for, 73 mixtures with carbon tetrachloride, 73 Chloroplatinic acid reduction with silane to prepare active catalyst, 145 p-chloro nitrobenzene electron paramagnetic spin resonance of chlorine hyperfine structure in, 208 Chlorophyll electronic structure of, 340-44 fluorescence of, 320, 324structure of, 341-42 Chloroplasts structure of, 315 Chromium filling d-shells when alloyed with aluminum, 114 intermetallic compounds of, 114-17 Chrysene aromatic chemical shift data from, 515 Claisen rearrangement pressure dependence study of, 356-57 Cluster integrals virial coefficients and, 33-34 Hartree-Fock calculations for, 259 carbon monoxide adsorbed on, 148 complexes of, 19 divalent relaxation of, 200 germanium compounds of. 118 intermetallic lanthanide compounds of, 120-24 Collagen cross linking in oriented systems of, 438 equilibrium stress-temperature data for, 436 melting temperature of, 442 Combustion radiant and conduction heat from, 449

from sound velocity, 77 Contractile processes phase change for, 429-45 Conductance pressure dependence of, 472 Coordination number change on melting a solid, 45 large values in intermetallic compounds, 111 Cope rearrangement pressure dependence study of, 356-57 Copolymers pressure dependence of composition of, 335 Copper carbon monoxide adsorbed on, 148 diamine complexes of, 19 dislocations in, 138 gold compounds of, 118 heat of combustion of, 455 intermetallic compounds of, 113 shock compression of, 360 trace amounts in water, 4 Copper fluoride carbon monoxide adsorbed on, 148 Carbon oxides carbon monoxide adsorbed on, 148 catalytic reactions on, 139-40 fast reduction of, 134 Coriolis coupling in average structure expressions, 227 Coriolis interactions as aid to vibrational assignments in microwave spectra, 236 Cosmology radio chemistry and, 5 Coupling constants absolute signs of, 510-11 Covalent bonds in iron-germanium compounds, 118 iron-silicon bond, 117 Critical constants inert gases theoretical values for, 34 Critical phenomena statistical mechanics for, 412-15 Critical temperature for binary mixtures, 66 Crystal field theory adsorption of oxygen and nickel oxide, 139 insights to chemisorption, 132 Crystal fields

effect on magnetically ordered materials, 122 quenching of orbital angular momentum, 121 Crystallization non-isothermal, 430 Crystal structure solid helium, 98-99 Cumulenes hydrogenation of, 142 Cuprous oxide weakly coupled exciton "hopping" in, 330 Curie point iron-germanium and irontin compounds table of, 169 Curie's law helium-3, 90 Curtius rearrangement pressure dependence study of, 357 Cyanamide structural study of, 245 Cyanocarbons heats of combustion, vaporization, and solution of, 453 Cyclazine electron paramagnetic resonance spectrum of, 206 Cyclic polymers electronic theory for, 341-42 Cyclobutanes hydrogenolysis of, 141 Cyclobutanone structural study of, 245 Cycloheptatrienyl radical electron paramagnetic resonance study of, 205 Cyclohexadienyl radical electron paramagnetic resonance study of, 202 Cyclohexane hydrogen bonding studies in, 73 thermodynamic data for fluorobenzene mixtures of, 77 Cyclohexene catalytic decomposition of, 137

catalytic hydrogenation of,

resonance study of, 205

resonance spectrum of.

vapor pressure of benzene

Cyclooctatetraenyl anion

electron paramagnetic

electron transfer in, 18 Cyclopentadienyl radical

electron paramagnetic

mixtures of, 75

136

202

Cyclopentane

hydrogenolysis of, 141 Cyclopentene structural study of, 245 Cyclopropane high initial energy of, 141 ring currents in, 516 chemical shifts for, 516 vicinal coupling constants for, 508 Cyclopropylamine nuclear magnetic resonance spectrum of, 494 Cyclopropyl anion electron paramagnetic resonance study of, 204 Cyclopropyl chloride microwave spectrum and structure of, 244 Cyclotron early history of, 9 isotopes from, 1 Cyclotron resonance scattering of electrons of gases studied by, 217 Cytochrome b<sub>6</sub> contribution to photosynthesis of, 334 D

Decafluorocyclohexene heat of combustion of, 453 n-Decanol mixtures with methane of, Decalin catalytic reactions of, 143 d-electron band sub-bands in alloys, 11 deHaas-Van Alphen effect distortion of Fermi surfaces and, 113 study of intermetallic compounds, 127 Dehydrochlorination t-butyl chloride, 138 Deuterium bond shortening due to, 228 catalytic exchange with hydrogen, 136 discovery of, 9 hydrogen exchange on semiconducting oxide surfaces, 140 nuclear magnetic resonance of, 499 solubility in benzene of, 68 theoretical treatment of, 49 Deuterium atoms electron paramagnetic resonance of, 210 Deuterium bonding

comparison with hydrogen bonding, 74 Diamond from shock transition of graphite, 361 melting of, 363 Diazirine microwave spectrum and structure of, 231 Diazonium salts thermal decomposition of, 207 Dibenzyl methyl amine inversion of, 27 Diborane heat of addition to olefins of, 457 nuclear magnetic resonance study of, 510 2,2-dibromocyclobutanone nuclear magnetic resonance study of, 507 Dibutyl ethers heat of combustion of, 451 Dicarbenes triplet states in, 216 1, 1-dichlorocyclopropane quadrupole coupling tensor for, 245 Dichlorophenol electron transfer in, 16 p-Dicyano tetrazine electron paramagnetic study of, 206 p-Dicyano tetrazine anion electron paramagnetic resonance line shape for, 199 Dielectric constant pressure dependence of, 359 Dielectric loss ion mobilities and, 483 Dielectric relaxation complex formation and, 27 ionic mobilities and, 483 Diels-Adler reaction pressure dependence study of. 356 Diethyl ether diffusion of, 66 heat of combustion of, hydrogen bond heat of formation, 73 Diethyl ketone hydrogen bond heat of formation, 73 Diffusion coefficient liquid helium-3, 87 nuclear magnetic resonance determination of, 407 Diffusion relation to viscosity, 67 aelf

dissociation constants

continuum model for ion-

for, 352

Electrolyte solutions

liquid helium-3, 90, 92-93 structural in methanol, 14 study of nitrogen-carbon monoxide mixtures, 66 Difluoramine microwave spectrum and structure of, 230 Difluorodiazine microwave spectrum and structure of, 230 Difluoroethylenes nuclear magnetic resonance spectra of, 494 Diketoninerazine radiolysis of, 213 Diketopiperazyl radical spin density of, 204 Dimethyl acetylene hydrogenation of, 142 Dimethyl amine microwave spectrum, structure, internal rotation, and inversion of, 233 Dimethyl ammonium ion protolysis of, 14 N. N-Dimethylaniline ethyl iodide reaction with pressure dependence of, 353 Dimethyl ether heat of combustion of, 451 Dimethyl selenide microwave spectrum, structure, and internal rotation of, 233 Dimethyl silane microwave spectrum and structure of, 244 Dimethyl sulfide microwave spectrum. structure, and internal rotation of, 232 Dinitrenes triplet states in, 216 2,4-dinitrotoluene photo-isomerization of, 24 Dioxane heat of mixing with carbon tetrachloride, 74 nuclear magnetic resonance study of hydrogen bonding in, 521 solubility of propane in, 67 stability of boat form of, 484 Diphenyl amine photo-oxidation of, 208 Dipole-dipole interactions nuclear nuclear magnetic resonance study of, 510 nuclear magnetic resonance relaxation and, 500 second virial coefficients and, 65

Dipole moments solvent interaction. theoretical calculation of, 479\_84 253 coupled transport processes, theoretical values for, 359 474-79 theoretical values for dissociation constants of, aliphatics, 264-65 474 equilibria in Dipropyl ether heat of combustion of, 451 pressure dependence of, 2,2' dipyridyl anion 357-59 electron paramagnetic resoionic mobilities in, 482 nance study of, 207 nuclear magnetic resonance Dissociation constants study of, 484, 489 pressure dependence of, thermal conductivity of, 357-59 475 Dissociation energies thermodynamic and equilibtheoretical calculations of. rium properties of, 254 472-74 Divinyl ether Electron configurations of heat of combustion of, 451 allovs DNA table of, 166 radiation of, 3 Electron diffraction stability toward solvents, correcting data for vibra-272 tional effects, 228 theoretical calculations conslow cerning, 270 for study of surface chemtwo strand istry, 133 helix to coil transforma-Electronegativity tion, 372 correlated to chemical shifts, 512 n-Dodecanol mixtures with methanol of, importance in formation 70 of intermetallic com-Double quantum transitions pounds, 110-11 nuclear magnetic reso-Electron impact nance spectra, 498 bond dissociation energies DPPH from, 463-64 Electronic spectra antiferromagnetism in, 217 spin lattice relaxation in. benzene adsorbed on glass, 200 147 Durenes study of chemisorption of chemical shifts in, 513 polynuclear aromatics, 149 Dysprosium intermetallic compounds of, Electronic structure importance in pseudo acids, 13 E influence of pressure on, 349 EDTA Electron microscopy chloroplast study, 315 metal complexes of, 20 DNA structures, 373 Effusion study of rare earth oxides. Electron paramagnetic resonance spectroscopy 460 Elastoidin ammonia maser preamplifimelting temperature of, er for, 217 442 applications to biological Elastomers systems of, 217 configurational energy of, coupling constant signs for 427 naphthalene, 198 Electrodes detection of free atoms with, 210 acid dissociation kinetics. electric field dependence of, 217 15 Electrolytes electron transfer studies, weak 18

exciton interactions, 200

experiments with living cells, 339-40

free radical

theoretical treatment. 270 g-factors theoretical treatment, 204 hydrogen adsorption studies, 147 hydrogen bond studies, 210 hyperfine coupling constants as aid to nuclear magnetic resonance studies, 502 instrumentation for, 217 intramolecular electron transfer and, 159 irradiation studies in liquid phase, 210-11 irradiation studies in solid phase, 211-14 line shapes, 198-201 methyl radical, 149 nitrogen containing radicals, 205-8 protein studies, 26 reaction of ethyl radicals, 22 semiconductors, 217 study of chemisorption of polynuclear aromatics, 149 study of hydroxyl radical, 245 triplet excitons, 216 triplet and higher multiplet studies, 214-17 viscous liquids line shapes for, 198 zero field splitting, 214 Electrons hydrated as intermediates in radiation chemistry, 21 Electron transfer intermolecular, 18 outer sphere, 17 potential energy surfaces for, 160-63 Electron transfer reactions discussion of, 16-19 ENDOR free radical study with, 217 Energy levels theoretical calculations of, 254 Enthalpy activation for proton transfer reactions, 14 PACPES hydrogen chloridelithium chloride mixtures, 473 hydration of protons, 481 Entropy catalysis and, 16

changes during denaturation of nucleic acids, 394 communal, 46 correction to, 51 deformation of, 421 effect in the structure of metals, 127 excess hard sphere assumption, 37-38 liquid helium at OOK, 85 melting, 46 phase change, solid helium, 99 pressure dependence for helium-3, 88 transported in cell reactions, 475-76 Entropy of solution hydrazoic acid in water, GR Enzymatic reactions kinetic studies of, 25 Enzymatic transamination catalysis of, 26 Enzymes reaction with pseudosubstrates, 26 Eosin as photosensitizer, 24 Equation of state cell and tunnel models of liquids, 47-48 hard sphere calculations, 37 helium at OOK, 49 Erbium intermetallic compounds of, 121 Esters hydrogen bonding with alcohols, 72 carbon-13 nuclear magnetic resonance spectrum of, 494 from catalytic decomposition of alkanes, 136 Hartree-Fock calculations for, 259 molecular integrals for, 263 PVT data for mixtures of, 66 solubility in alkanes of, 67 Ethanol dehydrogenation of, 138 microwave spectrum of, 234 radiolysis of, 22 Ether catalytic decomposition of, 137 combustion of, 450-

complexes with chloroform, 74 diffusion of, 66 hydrogen bond heat of formation, 73 Ethyl amine catalytic decomposition of, 137 Ethyl bromide catalytic hydrogenation of, 456 microwave spectrum and structure of, 244 quadrupole coupling constants for, 245 Ethyl chloride microwave spectrum and structure of, 244 quadrupole coupling constants for, 245 Ethyl cyanide coriolis coupling in, 236 Ethylene carbon-13 nuclear magnetic resonance spectrum of, 494 catalytic decomposition to acetylene, 137 hydrogenation of, 134 molecular integrals for, polymerization of, 364 quadrupole moment for, 85 theoretical treatment of spectrum of, 270 Ethylenediamine water-electron reaction in, 22 Ethylenes fluorinated microwave spectrum and structure of, 244-45 nuclear magnetic resonance spectra of, 494 spin-spin coupling constants for, 504 Ethyl ether adsorbed infrared study of, 148 Ethyl halides catalytic decomposition Ethylidene-isopropylimine hydrogen bond equilibrium constant with chloroform, 73 Ethyl iodide dimethylaniline reaction with pressure dependence of, 353 irradiation of, 2 Ethyl lithium heat of combustion of, 455 Ethyl radicals

one dimensional, 33

simple, 32-33

Fluorescence

delayed

electron paramagnetic resonance study of, 149 reactions of, 22 Ethyl vinyl ether heat of combustion of, 451 Exchange reactions nuclear magnetic resonance studies of, 520 Exciton Frenkel type, 329 intermolecular coupling of, 328-30 nucleic acids and, 390-91 triplet, 216 Wannier type of, 329-30 **Exciton** bands polymer transitions, 301 **Exciton** interactions terms contribution to. 330-31 Expansion coefficients

helium-3, 88

F2CO coriolis coupling in, 236 F20 average structure of, 227 centrifugal distortion analysis of, 237 microwave spectrum and structure of, 230 Fermi gas explanation of transport properties of liquid helium-3, 92-95 Fermi levels chemisorption and, 133 Fermi surfaces intermetallic compound stability and, 113 Ferric ion sulfate ion complexes of, 19-20 Ferrocytochrome oxidation of, 337 Ferromagnetism Ising model and, 415 Ferrous sulfate radiolysis studies in, 22 Fibrin melting temperature of, 442 oriented fiber of, 437 Field emission microscopy surface chemistry studies with, 131 Films structure from electron microscopy, 133 Flash desorption surface chemistry studies with, 131 Fluids equilibrium properties of,

407-12

hole-electron recombination and, 327 importance to photosynthesis, 327 time course of, 328 effect of trap depth on, 324 exciton, 324 nucleic acid studies, 382 time course of, 325-26 Fluorine chemical shifts for, 514 nuclear magnetic resonance coupling constants for, 494 Fluorine compounds organic heats of combustion of. 453-54 Fiuoroacetonitrile microwave spectrum and structure of, 244 Fluoroacetylene microwave spectrum and structure of, 244 Fluorobenzene thermodynamic data for cyclohexane mixtures of, 77 Fluorocarbons interaction with hydrocarbons, 72 physical properties of, 63 Fluorocyanide microwave spectrum and structure of, 244 Fluorocyclopentanone optical rotation in theoretical treatment of 290 Fluoroform excited states of anomalies in, 236 heat of hydrogen bond formation with tetrahydrofuran, 73 Fluoromethylacetylene microwave spectrum and structure of, 244 Fluoroprene lack of rotational isomers of, 234 Fluosilicic acid heat of formation of, 455 Formaldehyde average structure of, 227

theoretical treatment of

spectrum of, 270

catalytic decomposition of,

structural study of, 245

Formaldoxime

145

Formamide

Formic acid

adsorbed nuclear magnetic resonance study of, 148 adsorption on platinum and tungsten, 135 catalytic dehydrogenation of, 145 coriolis coupling in, 236 decarbonylation of, 145 dehydration of, 140 dissociation constant of. 474 lack of rotational isomers of, 234 Förster theory of energy transfer applicability of, 331-32 Four membered rings hybridization of bonds in, 505 Frank Condon principle electron transfer reaction and, 157 Free energy of solution hydrazoic acid in water, 68 Free radicals antiferromagnetism in, 217 electron paramagnetic resonance spectra of theoretical treatment, 270 ENDOR spectra of, 217 hydrogenation of, 144-45 microwave spectroscopic studies of, 245 nuclear magnetic resonance spectra of, 502 produced by high energy electron irradiation, 210-11 produced by irradiation, 2, 210-14 see also Radicals Fucoxanthin as photosynthesis pigment, 320 Fumaric acid irradiation of, 212 Furan microwave spectrum and structure of, 244 Furoic acid irradiation of, 212

# G

Gadolinium
intermetallic compounds
of, 120
Gadolinium carbide
effusion study of, 460
Gadolinium ferricyanide
conductance and dissociation of, 472
Gamma radiation

as a chemical species, 3 spectrum of human hair, 4 Gas chromatography solution studies, 75-76 Halogens Gases dense Hapten lattice theories of, 45-58 nonpolar rotational relaxation in, 407 404 solutions of, 67-68 G-factors theoretical calculation of, 204 Geiger counter history of, 8 isotope tracing, 1 Geometric mean rule dissatisfaction with, 63 Germanium bond energy of, 456 Germanium heat of combustion of, 455 Heat of hydrogen adsorption on, 135 iron compounds of, 118-19 metal transition pressure of, 362 organic compounds of heats of combustion of, 455 Glycine irradiation of, 212 metal complexes of, 19 Glycylglycine metal complexes of, 19 carbon monoxide adsorbed on, 148 copper compounds of, 118 intermetallic compounds of, 113 intermetallic lanthanide compounds of, 125 reaction with nitrogen, 460 mixing shock transition to diamond, 361 Gruneisen coefficients temperature dependence of, 360 H 458 Helium Hair

reaction with nitrogen, 460 shock transition to diamon 361
Gruneisen coefficients temperature dependence of 360

H
Hair human gamma ray spectrum of, 4 fainum heat of formation of, 457
Halide ions photolysis of solutions of, 21
Halides electron mediators, 17
Haloforms

heat of hydrogen bond formation with tetrahydrofuran, 73 theoretical treatment of, 55 reaction with antibodies, 25 Hard sphere fluids equilibrium properties of, Hartree-Fock calculations atoms, 258-59 diatomic molecules, 259 small molecules, 259-60 Hartree-Fock theory, 256-60 nuclear magnetic resonance spectrum of, 499 Heat capacity liquid helium-3 pressure effects, 88 Heat conductivity liquid helium-3, 87 atomization, 461 chlorination, 457 combustion alcohols, 450 boron compounds, 454 ethers, 450-51 hydrocarbons, 449-50 metals, 455 organometallics, 455 silicon compounds, 454 sulfur compounds, 454 dilution chlorates, 474 explosion, 456 fluorination, 455-56 formation theoretical techniques, 449-55 hydroboration, 457 hydrogenation, 456-57 hydrolysis, 458 ionization of water, 474 high temperature, 66 polymerization, 459 reduction by sodium, 457 hydrazoic acid in water, 68 thermal decomposition, immiscibility with xenon, 366 liquid specific heat of, 83-88 theory of, 51-52 second virial coefficient for, 65 at high temperature, 411 solid, 49 theoretical treatment of, 49

viscosity of, 66, 406

Helium-3 cyclotron acceleration of, 4-5 entropy at OOK, 85 expansion coefficient for, 88 liquid as ideal gas, 84-85 superfluidity question, 97-98 thermal conductivity of, 94-96 transport properties of, 92-95 viscosity, 93-94 zero sound in, 95-97 magnetic properties of, 88-91 magnetic susceptibility of, 88 nuclear magnetic resonance spectrum of, 89 nuclear susceptibility of, 90 pressure effects on, 88 self-diffusion of, 92-93 solid, 98-105 lattice properties of, 104minimum in melting curve of, 100 phase diagrams for, 98 specific heat at critical point, 52 superfluidity in, 88 Helium-4 gamma transition of, 84 liquid thermal excitations in, 84 specific heat at gamma point, 52 superfluidity in, 84 Helium atom exact treatment of, 255 Helium-like ions theoretical studies on, 265 Helmholtz free energy configurational, 413 Hexafluorobenzene heat of combustion of, 453 Hexamethylbenzene cation electron paramagnetic resonance spectrum of, 205 Hexamethyldisiloxane heat of formation of, 455 Hexamethylene tetramine anion electron paramagnetic resonance study of, 208 Hexane solubility of propane in, virial coefficients for, 66 n-Hexanol

hydrogen bonding with methyl caproate, 72 mixtures with methanol, 70 Hexaphenyl ethane dissociation constant of, 205 High pressure reactions steric hindrance in, 353-58 Holmium intermetallic compounds of, 121 Homopolynucleic acids helix formation, kinetics for, 26 Hydration, rates of, 16 Hydrazine catalytic decomposition of, 145 irradiation of, 211 microwave spectrum, structure, and internal rotation of, 232 nuclear magnetic resonance study of hydrogen bonding in, 521 oxidation of, 208 Hydrazine radicals exchange in, 206 Hydrazines properties of mixtures of, pyrrolysis of, 462 Hydrazoic acid thermodynamic properties of water solutions of, 68 Hydrocarbons hydrogen reactions on metal catalysts of, mixtures of, 68-71 theoretical calculation concerning, 55, 264 Hydrogen adsorption of platinum and tungsten, 135 from catalytic decomposition of alkanes, 137 catalytic exchange with deuterium, 136 chemisorption on platinum,

133

deuterium exchange on

electron paramagnetic

resonance coupling

constants for, 203

Hartree-Fock calculations

theoretical treatment of,

mixtures of alkanes with, 66

21

surfaces, 140 diffusion of, 407

for, 259

liquid

semiconducting oxide

nuclear magnetic resonance spectrum of, 499 PVT data for mixtures of, 66 quadrupole moment for, 65 solubility in alkanes, 67 theoretical treatment of, 49 Hydrogen atom electron paramagnetic resonance study of, 210 Hydrogen bonding chemical shifts and, 489 heats of formation of, 73 hydrogen fluoride dimer electrostatic contribution to, 259 nuclear magnetic resonance studies of, 484, 521 proton-hydroxyl ions reaction and, 13 rotational isomerism in, 210 in silylamines, 74 theoretical treatment of solutions and, 71 Hydrogen bromide aqueous vapor pressure of, 473 bond energy of, 456 Hydrogen chloride aqueous conductivity anomalies in, vapor pressure of, 473 bond energy of, 456 Hydrogen cyanide average structure of, 227 Hartree-Fock calculations for, 259 Hydrogen fluoride bond energy of, 456 magnetic properties of theoretical treatment of, 261 theoretical dipole moment of, 259 Hydrogen fluoride dimer electrostatic contribution to hydrogen bonding, 259 Hydrogen iodide aqueous vapor pressure of, 473 bond energy of, 456 Hydrogen peroxide catalytic decomposition of, 139 irradiation of, 213 photolysis of, 21 Hydrogen selenide average structure for, 227 Hydrogen sulfide adsorption on tungsten, 135 Hydroxide ion photolysis of solutions of,

as enzyme inhibitor, 26 reaction with t-butyl ketone, 355 Hydroxyl radical dipole moment of, 245 electron paramagnetic resonance study of, 209 microwave spectroscopic study of, 245 Hypo-phosphorous acid proton exchange in, 15 reaction rates in, 193 see also Water Imidazole metal complexes of, 19 Index of refraction pressure dependence of, 361 Indium dissociation of salts of, 474 EDTA complexes of, 20 intermetallic compounds of, 128 INDOR double irradiation techniques, 497 instrumentation for, 490 Inert gases critical constants for theoretical values, 34 see also Rare gases Inertial defect planar molecules and, 229 Infrared spectroscopy adsorbed hydroxyl group study, 147 adsorption on zeolites. 147-48 coordination with microwave spectroscopy studies, 235-37 hydration studies on nucleic acids, 389 hydrogen bonding studies, 74 nucleic acid studies, 378-79 SO<sub>2</sub>F<sub>2</sub> spectra, 235-36 Insulin oriented fibers of, 437 Intermetallic compounds definition of, 109 factors responsible for compound formation, 110-14 Laves phase compounds,

125-27

Intermolecular forces

2-Hydroxyacetophenone

Hydroxylamine

proton exchange in, 27

theoretical correlations

of, 64

theoretical and empirical studies of, 271-72 Internal rotation 18 theoretical barriers for ethane, 259-60 20 theoretical calculations, 264 Invar shock demagnetization of, 361 Inversion dibenzyl amine, 27 dimethyl amine, 233 Iodide ion photolysis of solutions of, 21 Indine diffuse reflectance spectra flash photolysis of, 24 gas phase equilibrium with olefines, 460 Isoprene isotopic exchange in methyl iodide, 353 metal transition pressure of, 362 Iodine-127 nuclear magnetic resonance rate studies with, 21 Iodine-128 production by neutron capture, 2 Iodoform heat of formation of hydrogen bond with tetrahydrofuran, 73 Ionic mobilities dielectric loss and, 483 dielectric relaxation and, 483 Ionization potentials approximation of, 66 theoretical calculation of, 254 Ion pairs pressure dependence study of, 358-59 Ions positive as chemical species, 2 determining reaction course, 2 Ion-solvent interaction continuum model for, 479-84 Iridium decomposition of alkanes 68 on, 137 nitrogen adsorption on, 133 ethane adsorption on, 137 germanium compounds of, 118-19 intermetallic compounds of, 117-20 intermetallic lanthanide

compounds of, 120-24

shock compression of, 360 silicon compounds of, 117sulfate complexes with, 19tin compounds of, 119-20 Irreversible thermodynamics, books on, 474 Ising model ferromagnetism and, 415 Isobutylene catalytic hydrogenation of, 145 Isomerism pressure dependence of, 355 rotational microwave spectroscopic studies of, 233 Isooctane solubility of gases in, 68 dimerization of, 351 pressure dependence of, 350 heat of polymerization of, 459 lack of rotational isomers of, 234 Isopropyl alcohol catalytic decomposition of, 140 catalytic dehydrogenation of, 145 Isopropyl chloride microwave spectrum and structure of, 244 Isopropyl ether hydrogen bond equilibrium constant with chloroform, 73 Isopropyl iodide reaction with amines pressures dependence of, 354 reaction with triethyl phosphite pressure dependence of, 355 Isotope effects bond lengths, 228 chemical shift changes in water, 518 hydrogen and deuterium bonding, 74 solutions of gases in water, Isotopes synthetic, 1 tracing of, 1 Itaconic acid irradiation of, 212 Joule-Thomson coefficient

K Keratins contractility in, 443 Ketene spectroscopic study of, 236 Ketones aromatic photolytic reduction of, 23 energy transfer in excitation of, 23 nuclear magnetic resonance studies of hydrogen bonding in, 521 optically active complexity of ultraviolet absorption in, 291 spin densities of, 204 Kinetics acid dissociations, 15 heats of formation and dissociation energies from, 461 helix formation in homopolynucleic acids, 26 hydration of aliphatic aldehydes, 27 Langmuir-Hinshelwood hydrogenation of methylbenzene, 144 nuclear magnetic resonance studies of, 520 protein reactions, 25 study of enzymatic reactions, 25 Krypton chemisorption on metals, 133 liquid thermal conductivity of, 407 viscosity of, 66 Krypton fluorides theoretical study of, 272 L

Langmuir-Hinshelwood kinetics hydrogenation of methyl benzenes, 144
Lanthanides effective moments of, table of, 124 intermetallic compounds of, 110 table of magnetic moments, 122

metal compounds of, 120-25

Landau theory

Fermi liquids, 84

Lanthanum cobalticyanide conductance and dissociation of, 472 LCAO calculations surface states and chemisorption treated by, 132 importance of electronegativity in forming magnesium compounds. 111 shock compression of, 360 Leonard-Jones parameters from viscosity, 65 Leonard-Jones 6:12 potential applied to simple fluids, 32 Ligand field theory chemisorption and, 132 Liquida lattice theories of, 45-58 Liquid-vapor equilibrium high pressure, 77 Lithium chlorate heat of dilution of, 474 Lithium chloride microwave spectrum and structure of, 239 Lithium fluoride dehydrogenation of ethanol on, 138 Hartree-Fock calculations for, 259 microwave molecular beam study of, 239 neutron irradiated F-centers in, 209 theoretical dipole moment for, 259 Lithium hydride Hartree-Fock calculations for, 259 magnetic properties of theoretical treatment of, theoretical calculations on, theoretical dipole moment for, 259 Lithium ion mobility of, 483 Lithium nitrate conductance in ethanol-water solutions, 471 Lorentz gas viscosity of, 402 Lutetium intermetallic compounds of, 121 Lutidenes

heats of combustion of, 452

M

Macromolecules
enzymatic reactions and, 25
Madelung energy
ionic crystals, 111

Magnesium
importance of electronegativity in forming lead
compounds, 111
zinc compounds of, 111
Magnesium fluoride

heat of formation of, 455 Magnesium ion theoretical treatment of,

257 Magnetic anisotropy

ring currents and, 512-13
Magnetic behavior of metals
chromium-aluminum
compounds, 114
counting 3rd electrons and,
114

finely divided supported metals, 136 intermetallic lanthanides,

120-25 lack of localized moment in chromium, 116

Mossbauer studies of fields at nuclei, 117-

properties of iron-germanium and iron-tin compounds

table of, 119 shock demagnetization, 361 spiral magnetic structures, 123

temperature dependence of susceptibility, 114 Magnetic fields

strength at nucleus in metals,

Magnetic properties
theoretical calculations of,
251
Magnetic resonance

Magnetic resonance
high pressure studies of,
349
Malononitrile

vibrational assignment of, 236

Manganese filling d-shells when alloyed with aluminum, 114

Many-electron system wave functions and energy for, 251-55

Marcus theory electron transfer, 17 Maser

maser ammonia

as electron paramagnetic resonance spectrometer preamplifier, 217 applied to microwave

spectroscopy, 246 Mass spectroscopy isotope tracing, 1 study of rare earth oxides, 460

Mechanochemical systems

cyclic reversible processes, 429 thermodynamics of, 424-25

Melting curves review for high pressure work, 350

Menshutkin reaction pressure dependence of, 353-54

Mercury iodine and bromine complexes of, 21

radial distribution function of, 412 Mesitylenes

chemical shifts in, 513 Metal chlorides heats of formation of, 457

Metal complexes anomalous dispersion in, 308

Metal ketyls spin densities of, 204 Metal oxides adsorption of carbon mon-

oxide and carbon dioxide on, 148-49

Metals adsorption of carbon monoxide and carbon dioxide on, 148-49

band theory of, 111-12 behavior at high temperature and pressure, 349 chemisorption on, 133-36 complexes of, 19-21

complexes of, 19-21 films of, 4-5 structure from electron microscopy, 133

heats of combustion of,

knowledge vs. usefulness, 110 liquid

theoretical treatment of, 55 relaxation in liquid ammonia,

shock compression of, 360 specific heats of temperature dependence

of, 360 spiral magnetic structure of, 123

strength of magnetic fields at the nucleus, 117 structure of iron-germanium and iron-tin compounds

and iron-tin compounds table of, 119 transition to metallic state

due to pressure
Meteorites
time scales and, 5
Meteors

ultrafast reactions during impact, 363

Methane average structure of, 227 binary mixtures of, 66 bond energy of, 456 from catalytic decomposition of alkanes, 136 catalytic deuteration of, 142 deuterated nuclear magnetic resonance spectra of, 501-2 Hartree-Fock calculations for, 259 errors in, 260 liquid equation of state for, 412 mixtures with rare gases. 65 molecular integrals for, 263 molecular orbitals for, 262 nuclear magnetic resonance spectrum of, 501 PVT data for mixtures of, 66 theoretical spin-spin coupling constants for, 506 thermal conductivity of, 407 Methanol mixtures with higher normal alcohols, 70 proton transfer reactions in. 14 solvation by, 483 Methyl acetylenes coupling constants for, 410 Methylallene hydrogenation of, 142 Methyl ammonium ion protolysis of, 14 N-Methyl aniline pyrolysis of, 462 Methyl benzene kinetics for hydrogenation of, 144 spin densities for, 202 Methyl borazines theoretical calculations concerning, 264 Methyl bromide catalytic hydrogenation of, 456 Methyl caproate hydrogen bonding with hexanol, 72 3-Methyl-cyclopentanone theoretical treatment of, 287

4-Methyl diphenyl

of, 205

Methylene chloride

electron paramagnetic

resonance spectrum

quadrupole coupling tensor for, 245 Methyl ethyl ether heat of combustion of, 451 Methyl-fluorosilanes microwave spectroscopic studies of, 244 Methyl formate decarboxylation of, 145 Methylhydrindene theoretical treatment of phenyl group of, 294 Methyl iodide iodine isotopic exchange reaction, 353 Methyl mercaptan catalytic decomposition of, 138 Methyl methacrylate polymerization of, 364 Methyl nitrate barrier to internal rotation in, 233 Methyl oxonium ion proton transfer with benzoic acid, 15 N-Methyl pyrrolidine hydrogen bond equilibrium constant with chloroform, 73 Methyl radicals electron paramagnetic resonance study of, 149 Methyl salicylate nuclear magnetic resonance study of, 498 Methyl silyl acetylene microwave spectrum, structure, and internal rotation study of, 233 Micelles pressure dependence of formation of, 359 Microwave spectroscopy beam maser application, 248 centrifugal distortion analysis in, 237 charge transfer studies, 27 high temperature studies, 238-40 instrumentation for, 240 intensity measurements, 244 internal rotation rotational isomerism, 231-35 two top molecules, 232-33 klystron stabilization, 241-42 nonbonded interactions, 232 quadrupole coupling constants from, 245

structure of new or unusual molecules, 230-31 study of surface films, 146 vibrational information from, 235-38 Mixtures compressibilities of, 77 diffusion of, 66 gaseous, 63-67 PVT data for, 66 high pressure studies, 78 hydrocarbons, 68-71 theoretical treatment of, 55 thermodynamic properties of, 49, 63 vapor pressures of, 77 Molecular beams high temperature electronic resonance, 239 Molecular structure, 225-30 average structures, 227 ro as compared to re, 226-20 substitution coordinates, 226 vibration-rotation interaction, 226-27 Molybdenum ethane adsorption and reactions on, 137 films adsorption of carbon monoxide and nitrogen on, 135 intermetallic compounds with technetium, 128 Monte Carlo techniques hard sphere approximation, 32 rate of decay to equilibrium, 404 Morse potential applied to gaseous mixtures, 65 Mossbauer effect intermetallic compound studies using, 110 studies of iron-silicon compounds, 117 used to determine diffusion coefficients, 407 Multipoles second virial coefficient and, 65 Muscle fiber contractility of, 444 N Naphthacene dianion

Naphthacene dianion flash photolysis of, 23 1-Naphthaldehyde triplet states in, 23 Naphthalene

electron paramagnetic resonance coupling constants for, 198 electron transfer in, 18 Naphthalene ions dimethyl substituted spin densities of, 204 g-factor anisotropy in, 204 Neel points iron-germanium and irontin compounds table of, 119 iron-silicon compounds, 117 Neodymium intermetallic compounds of, 120 Neodymium ferricyanide conductance and dissociation of, 472 Neon semi-empirical correlation energy of, 268 theoretical treatment of, 254 viscosity of, 66, 406 Neopentane adsorption of, 137 PVT data for, 66 Neptunium discovery of, 3 Neutron capture iodine 128, 2 Neutron diffraction covalency of the ironsilicon bond, 117 magnetic moment measurements in metals, 115 study of spiral magnetic structures of metals. Neutrons discovery of, 9 inelastic scattering of, 10 transuranic atoms and, 5-6 NF<sub>2</sub> study of, 245 Nickel catalytic activity of, 138 chemisorption of hydrogen on, 133 complexes of, 19 ethane adsorption on, 137 germanium compounds of, 118 intermetallic lanthanide compounds of, 120-24 nonmetallic forms of, 121 organic salts of heats of combustion of, 455 shock compression of, 360 superparamagnetism in, 136

Nickel films

on, 134 structure from electron microscopy, 133 Nickel oxide catalytic reactions on, 138-39 fast reduction of, 134 Niobium intermetallic compounds of superconducting magnet material from, 128 Nitramide structural study of, 245 Nitrate ion magnetic anisotropy in, 516 Nitrates irradiation of, 213 Nitration of aromatic rings pressure dependence of isomers produced, 355 Nitric oxide averate structure of, 227 microwave spectroscopic study of, 245 Nitrile radical ions electron paramagnetic resonance study of, 205 spin densities in, 203 Nitriles magnetic anisotropies of, 516 Nitrobenzene electron paramagnetic resonance study of, 208 Nitroform photochemical isomerization of, 24 Nitrogen adsorbed on metals, 133 binary mixtures of, 66 diffusion of, 66 electron paramagnetic resonance coupling constants for, 203 free radicals containing, 207 Hartree-Fock calculations for, 259 Joule-Thomson coefficients for, 64 quadrupole moment for, 85 reaction with graphite, second virial coefficient for, 65 solubility of in alkanes, 67 in water, 68 viscosity of, 66, 406 Nitrogen atoms electron paramagnetic resonance study of,

resonance study of, 206 Nitromethane second virial coefficients for mixtures of, 65 Nitrosyl fluoride chemical shifts in, 514 para-Nitrotoluene absolute signs of coupling constants for, 491 Nitrous oxide catalytic decomposition of, 145 Nonadiabatic processes electron transfer reactions, 180-83 Nonlinear coupled oscillators energy sharing in, 404 NSF microwave spectrum and structure of, 230 NSF microwave spectrum and structure, 230 Nuclear magnetic resonance A<sub>2</sub>B<sub>2</sub> and A<sub>2</sub>X<sub>2</sub> studies, adsorbed formic acid study, 148 applications of, 519-21 chemical shift corrections and hydrogen bonding, 73 chemical shift parameter, 511-19 conflict with thermodynamic data on hydrogen bonding, 73 coupling constants absolute signs of, 491 diffusion coefficients from, 407
"direct" interpretive techniques, 496-99 double irradiation techniques, 496-99 double resonance techniques fast reaction rate studies, 27 review of, 490 to determine relative sign of coupling constants, 495 electric field effects in, 491 electron transfer studies with, 18 fast reaction data from, 14 field-frequency stabilization for, 490 gaseous samples

Nitrogen-containing hetero-

electron paramagnetic

cyclic anions

# SUBJECT INDEX

collision narrowing in. 492 gas phase, 494 high resolution spectra from earth's magnetic field, 492 hydrogen bonding effects on chemical shift, 489 hydrogen bonding in solutions, 73 hydrogen bonding studies with, 521 utilizing infrared information, 74. instrumental developments, 490-92 intramolecular rotation study, 27 inversion of dibenzyl methylamine, 27 kinetic studies with, 520 liquid helium-3, 89 nuclear spin decoupling, 490 nucleic acid studies, 376-78 organo-metallic studies. 494 pressure dependence of chemical shifts, 166 protolytic relaxation, 492 relaxation times temperature dependence of, 147 sensitivity improvements for, 491 solid helium, 103 spectral interpretation, 492-96 spin relaxation, 499-502 spin-spin interaction, 502-11 studies of electrolyte solutions, 484 studies of paramagnetic materials, 518 water adsorbed on silica, Nuclear explosions shock waves from, 360 Nuclear physics applied to chemistry, 1 Nuclear spin ordering solid helium, 99-100, 102-4 Nuclear susceptibility temperature independence in liquid helium-3, 90 Nucleic acids activity coefficients of, 382-83 electron microscopy studies, 373 genetic "words," 373-74 infrared absorption studies, 378-79 infrared structural data for

table of, 379 kinetics of helix formation, 26 nuclear magnetic resonance of, 376-78 optical rotation in, 382 physical chemistry of, 383-91 physical properties of, 376-83 quantum chemistry of, 390-91 sequence, 373-76 solution properties of, 387-89 structure of, 371-76 table of ultraviolet absorption spectra for, 380 thermal denaturation of, 383-87 thermodynamics of, 383-83 ultraviolet absorption studies of, 379-82 ultraviolet fluorescence of, 382 O A9, 10-Octalin catalytic deuteration of, 142 Octane solubility of propane in, 67 n-Octanol mixtures with methanol, 70 Olefins chemical shifts in, 513 gas phase equilibrium

with iodine, 460 heats of reaction with diborane, 457 polymerization of, 363 selective catalysts for reduction of, 145 **Opalescence** study in argon, 415 Optical rotation current states of carbonyl chromaphore, 285-94 metal complexes, 307-9 nucleic acids, 382, 390 optically active polymers, 301-7 phenyl chromaphore, 294-01 polypeptides, 302-7

of polypeptides, 302-7
Orbital angular momentum crystal field quenching of, 121
Orbitals
Hartree-Fock theory of,

356-60 Organometallics n-Propyl compounds nuclear magnetic

resonance study of. 494 Ortho-diazines electron paramagnetic resonance study of, 206 Osmotic coefficient for cesium and rubidium fluoride, 473 Ovalhumin photolysis of, 24 Overhauser effect nuclear magnetic resonance study of, 498 Oxalate complexes electron transfer in, 17 semiconducting catalytic reaction of, 138-40 activation of, 4

activation of, 4
adsorbed on metals, 4-5
adsorbed on zinc oxide
electron paramagnetic
spin resonance study
of, 149
binary mixtures of, 66
photolysis of, 21
solubility in alkanes, 67
solubility in water, 68
theoretical considerations,
257
Oxygen-17

theoretical considerations, 257
Oxygen-17
nuclear magnetic resonance reaction rate studies with, 14
nuclear magnetic resonance studies using, 510
Oxygen atoms electron paramagnetic resonance study of, 210
Ozone average structure of, 227 centrifusal distortion

average structure of, 22 centrifugal distortion analysis of, 237 miscibility with perfluoromethane, 78

P

Palladium
ethane adsorption on, 137
intermetallic compounds
of, 128
Palladium films
structural changes in,
133
Palmitic acid
irradiation of, 212
Paraffins
2-methyl
equation of state for, 66
Paramagnetic molecules
microwave spectroscopic

studies of, 245

Particle distribution function long time behavior of, 396 Peltier heats electrolytic, 476 Pendulum self energizing thermoelastic equivalent of Carnot cycle, 429 Pentacene cation electron paramagnetic resonance study of, 205 Pentanes virial coefficients for, 65 viscosities of, 66 Perchloric acid dissociation constant for, heat of dilution of, 474 Perfluoroallyl radical electron paramagnetic resonance study of, 208 Perfluoroheptane solubility of ethane and propane in, 67 Peroxylamine disulfonate anomalous electron paramagnetic spin resonance relaxation in, 199 Phase diagrams solid helium-3, 98 Phase transition statistical mechanics for, 412-15 Phenanthrene double quantum transition in electron paramagnetic resonance of, 216 Phenol nuclear magnetic resonance study of hydrogen bonding in, 521 photolysis of, 24 reduction of, 207 Phenyl chromaphore theoretical treatment of, 294-301 Phenyl radical from decomposition of iodobenzene, 212 Phenyl trimethyl germanium electron paramagnetic resonance study of, 208 Phenyl trimethyl silane anion electron paramagnetic resonance study of, 208 Phonons relaxation of, 200 thermal excitation in liquid helium-4, 84 zero sound in liquid helium-3, 96 Phosphate complexes electron transfer in, 17

Phosphates

hydration catalyst, 16 Phosphides effusion studies of, 460 Phosphine bond energy of, 456 as stabilizing ligand, 141 Phosphorus Hartree-Fock calculations for, 258 nuclear magnetic resonance study of, 496 Phosphorus-32 tracer development, 10 Phosphorus compounds organic nuclear magnetic resonance of hydrogen bonding in, 521 Photoconductivity of organic crystals theoretical work on, 272 Photo-oxidation electron paramagnetic resonance study of aniline and diphenylamine, 208 Photosynthesis aging changes in, 322 charge transfer in, 313 fluorescence studies and, 320 importance of delayed fluorescence in, 327 model for, 312-13 pigments, 312-23 primary photochemical steps of, 332-40 production of oxygen without, 336 quanta necessary for, 311 saturation intensities, 318 wavelength dependence of, 314 Phthalonitrile ion electron paramagnetic resonance study of, 206 Phycobilins as pigments in photosynthesis, 314 Phycoerythin as pigment in photosynthesis, 314 Phytol absolute stereochemical configuration of, 340 **Picolines** heats of combustion of, 452 Pi-electron system theoretical treatment of. 258 Pi-electron theory, 269-71 Piperidene radiolysis of, 213 Platinum adsorption of oxygen on, 134 catalytic

platinic acid, 145 chemisorption of hydrogen on, 133 ethane adsorption on, 137 intermetallic compounds of. 128 Plutonium development of, 3 Plutonium carbide effusion study of, 460 Plutonium oxide effusion study of, 460 Polarizabilities approximations of, 66 Polarons electron transfer reactions and, 158 Polonium alpha particles of, 9 historical importance of, Polyamides elastomer properties of, 422 Polydimethylsiloxane elastomer properties of, non-isothermal crystallization of, 430 Polyethylene cross-linking by gamma rays in, 3 cross-linking in oriented systems, 438 elastomer properties of, 422 irradiated electron paramagnetic resonance spectrum of, 202 non-isothermal crystallization of, 430 Polymerization pressure dependence of, 363-65 stereochemistry of pressure dependence of, 364 Polymer radicals electron paramagnetic resonance study of, 149 Polymers nuclear magnetic resonance study of, 496 optically active, 301-7 solution of. cell theory for, 70 Polypeptides optical rotation in, 302-7 phase transitions in, 415 Polystyrene cross-linking in oriented systems, 438 Porphyrins chemical shifts in, 519

from reduced chloro-

# SUBJECT INDEX

Radium

electronic structure of. 340-44 triplet states in, 343 Potassium flash photolysis of, 22 sodium compounds of, 111 Potassium chlorate heat of decomposition of, 458 Potassium cyanide hydrolysis of, 16 Potassium fluoride microwave molecular beam study of, 239 Potassium iodide electron transfer in, 21 Potassium ion mobility of, 483 Potassium nitrate conductance in ethanolwater solutions, 471 Potassium persulfate irradiation of, 213 Potassium thiosulfates irradiation of, 213 Potentials hard sphere applied to simple fluids, 32 Praseodymium intermetallic compounds of, 120 Propane adsorption on metal films, 136 derivatives of, rotational isomerism of, 233 solubility of, 67 virial coefficients for, 65 Propylene derivatives of barrier to internal rotation in, 231 n-Propyl metal compounds nuclear magnetic resonance of, 494 Proteins contractility of fibrous, 440-44 crystallinity of, 440 elastomer properties of, 422 fibrous melting of, 440-41 position in chloroplasts, 316 reaction kinetics for, 25 thermodynamic stability of, 442-43 Protons magnetic moment of, 492 transfer rates for, 13 Pseudo acids reactions of, 13 Pseudorotation

evidenced in tetrahydrofuran, 245 Purine bases theoretical calculations concerning, 270 Pyracene radical electron paramagnetic resonance, line shapes for, 199 Pyridine heats of combustion of, 452 hydrogen bond equilibrium constant with chloroform, 73 nuclear magnetic resonance study of hydrogen bonding in, 521 pressure dependence of reactions butyl bromide, 353 isopropyl iodide, 345 Pyrimidine bases theoretical calculations concerning, 270

# Q

Pyrolysis studies, 462

Quadrupole moments microwave spectroscopic study of, 245 nuclear magnetic resonance, relaxation and, 500-2 Quadrupole-quadrupole interactions nonpolar molecules and, 65 Quantasomes photosynthesis and, 317-19 Quantum mechanics applied to nucleic acids, 390-91 density matrices, 272 intermolecular forces, 271-72 one electron properties, 261 pi-electron theory, 269-71 Quartz heat of formation of, 455 Quinone contribution to photosynthesis of, 334 R

Radial distribution function x-ray studies of, 36 Radiation chemistry fast reaction and, 21-25 Radicals recombination of, 212 see also Free radicals Radioactivity discovery of, 1

historical importance of, Raman spectroscopy fast reaction rates, measurements with, 15 measurement of dissociation constants with, 474 SO<sub>2</sub>F<sub>2</sub>, 235-36 surface chemistry studies with, 146 Rare gas halides theoretical study of, 272 Rare gases crystalline weakly coupled exciton hopping in, 330 immiscibility of, 366 mixtures of, 65 viscosity of, 406 Rate constants factors affecting, 13 Reaction mechanism use of pressure to lucidate, 356 Reaction rates high pressures and, 250vibration state dependence, 18 Reactions under pressure linear free energy relations for, 352 Relaxation times helium-3 collisions, 87 longitudinal and transverse for helium-3, 90 nuclear measurement of, 492 Resonance energy benzene compared to hexafluorobenzene, 454 Rhenium intermetallic compound with technetium, 128 Rhodium decomposition of alkanes on, 137 Riboflavin flash photolysis of, 26 Ribonuclease oriented fibers of, 437 Ring compounds hybridization of bonds in, 505 small carbon catalytic hydrogenolysis of, 132 Ring currents cyclopropane, 516 Ring systems strain energy in, 449-50 Rotational isomerism conjugated double bond

systems, 234

spectrum of, 495

hydrogen bonding exhibiting. 210 microwave spectroscopic studies of, 233 pressure dependence of, 355-56 Rotons thermal excitation in liquid helium-4, 84 Rubber cross-linking in oriented systems, 438 elastic deformation of, 425-29 Rubidium fluoride activity and osmotic coefficients for, 473 microwave molecular beam study, 239 Ruthenium intermetallic compounds of, 128 Rydberg series molecular, 287-88 Sarcosine protolytic reactions of, 15 Salicylaldehyde proton exchange in, 27 Salts fused theoretical treatment of. thermodynamic properties of, 49 Samarium intermetallic compounds of, 120 Scandium heat of combustion of, 455 Scintillation counter isotope tracing, 1 Seebeck voltage semiconducting oxide studies, 140 Selenium metal transition pressure of, 362 polymerization of, 364 Selenium hydride bond energy of, 456 Semiconducting oxides hydrogen-deuterium exchange on, 140 surface chemistry of, 138-40 Semiconductors electron paramagnetic resonance in, 217 Semiquinones spin densities in, 201 ST Microwave spectrum and structure of, 230

nuclear magnetic resonance

S2F2 Sodium hydroxide microwave spectrum and aqueous conductance of, 470 structure of, 230 Sodium ion Shock wave experiments, 359-62 theoretical treatment of, nuclear explosions, 360 257 Silane Sodium nitrate bond energy of, 456 irradiation of, 470 Silica Sodium thiosulfate as metal support, 135,36 irradiation of, 213 Silicon SO<sub>2</sub>F<sub>2</sub> Hartree-Fock calculations infrared microwave, and for, 258 Raman spectra of, iron compounds of, 117-18 235-36 metal transition pressure Solid phase reactions of, 362 pressure dependence of, spectroscopic study of 357 adsorbed hydrogen on, Solida decomposition of 146 Silicon compounds pressure dependence of, heats of combustion of. 357 relaxation data from 454-55 ultrasonic spin resomicrowave spectroscopic nance, 200 studies of, 244 Silicon hydrides superheated chemical shifts for, 512 from theoretical treat-Silicon tetrafluoride of liquids, 48 heats of formation of, 455 Solutions Silver fluorocarbons adsorption of oxygen on, physical properties of, 134 63 gaseous, 67-68 carbon monoxide adsorbed hydrogen bonding in, 71 on. 148 solid, 109 intermetallic compounds of. 113 Solutions of electrolytes intermetallic lanthanide conductance and transport compounds of, 125 numbers for, 469-72 Silver iodide Solvents metal transition pressure participation in proof, 362 tolytic reactions, 13 Silver nitrate SO radical conductance in ethanolmicrowave spectroscopic water solutions, 471 study of, 245 Silvlamines Soret coefficients hydrogen bond studies, 74 aqueous cadmium sulfate, Skin effect 476 anomalous Sound distortion of Fermi zero surfaces, 113 liquid helium-3, 95-97 Sodium Specific heat anomalies due to superpotassium compounds of, 111 fluidity, 97-98 Sodium benzoate solid helium, 99 proton transfer with temperature dependence benzoic acid, 14 of. 360 Sodium borohydride Spectral levels catalyst formation with, theoretical calculations 145 of, 254 Sodium chlorate Spectroscopy heat of decomposition of, bond dissociation energies 458 from, 462-63 heat of dilution of, 474 hydrogen bond studies, Sodium chloride 74 crystallography of, 481 Raman Sodium fluoride reaction rates from, 15 microwave molecular reaction rate studies, 16

beam study of, 239

T

violet; Electronic, Electron paramagnetic resonance; Nuclear magnetic resonance; and Mass spectroscopy Spinach lamellae chloroplasts in, 317 Spin decoupling nuclear magnetic resonance and, 496-99 Spin densities negative, 201 theoretical work, 201-4 Spin echo technique attachment for Varian nuclear magnetic resonance spectrometers, 499 magnetic susceptibility of helium-3, 89-90 microwave measurements on electron spins, 200 solid helium, 104 Spin-spin coupling constants absolute sign of, 503 pi-electron systems, 509 relative signs of, 495-96 theoretical studies, 502-11 vicinal constants, 507 Stannane bond energy of, 456 Statistical mechanics equilibrium systems, 407-16 lattice statistics, 415-16 phase transitions and critical phenomena, 412-14 simple fluids, 32-33 theory of denaturation of nucleic acids, 386-87 transport theory, 395-407 Stereochemistry. pressure dependence of polymerization, 364 Steric hindrance acid-base rate constants, 13 heats of combustion studies of, 449-50 high pressures and, 353-56 pressure dependence of reactions and, 354-55 Steroids anisotropic diamagnetic shielding in, 516 Stibine

relaxation

50

metal complexes, 19

see also Infrared; Ultra-

protolytic reactions, 13

surface chemistry and, 146-

bond energy of, 456 Stress-strain isotherms analysis for elastomers, 427 Strontium heat of combustion of, 455 Strontium difluoride nonlinearity of, 262 Styrenes chemical shifts in, 513 polymerization of, 363 Sulfate complexes electron transfer in, 17 Sulfate ion complexing with ferric ion, 19-20 Sulfones theoretical torsional barriers for, 264 Sulfur adsorption on tungsten, free radicals containing. 207, 245 Hartree-Fock calculations for, 258 polymerization of, 364 Sulfur compounds heats of combustion of. 454 Sulfur dioxide average structure of, 227 catalytic oxidation of, 140 centrifugal distortion analysis of, 237 excited states of, 228 heat of oxidation of, 454 Sulfur hexafluoride solubility and partial molar volume of, 67 Sulfuric acid radiolysis studies in, 22 Superconductivity theory of, 97 Superfluidity anomalies in specific heat from, 97-98 existence in liquid helium-3, 97-98 Superparamagnetism nickel particles exhibiting, 136 Surface area determination from adsorption studies, 133 Surface chemistry spectroscopic studies of, 146-50 Surface states quantum mechanics of, 132 Surface tension theory of, 55 Swiss chard chloroplasts of, 336

Tantalum heat of combustion of. 455 intermetallic compounds of, 128 Tantalum carbide heat of combustion of. 455 Technetium intermetallic compounds of. 128 Tellurium electron paramagnetic resonance study of, 208 Tellurium hydride bond energy of, 456 Terbium intermetallic compounds of, Tertiary butyl compounds structure of, 244 Tetraalkyl ammonium halides irradiation of, 211 Tetrachloroethylene copolymer with vinyl acetate, 355 Tetracyanoethylene electron paramagnetic resonance study of, 208 Tetrafluoride methane solubility and partial molar volume of, 67 Tetrahydrofuran flash photolysis of potassium in, 22 heat of hydrogen bond formation with haloforms, 73 pseudorotation in, 245 Tetramethyl compounds nuclear magnetic resonance study of, 505 Tetramethylcyclohexane catalytic deuteration of, 143 Tetramethyl ethylene polymerization of, 355 Tetravinylsilane nuclear magnetic resonance, 495 Thallium halides metal transition pressures of, 362 Thermal conductivity electrolytic solution studies of, 475 liquid helium-3, 94-95 liquid rare gasses, 407 relation to rotational relaxation, 404 temperature dependence

intermetallic compounds

for measurements for argon, 406 Thermodynamic properties fused salts, 49 intermolecular forces from, 63 mixtures, 49 Thermoelasticity development of, 421 Thermoelectric cooling applied to calorimetry, 76 1,2,5-Thiadiazole microwave spectrum and structure of, 231 Thianthrenes electron paramagnetic study of, 209 Thiocvanate as electron mediator, 17 Thiocyanate ion photolysis of solutions of, 21 Thiophene microwave spectrum and structure of, 244 Thorium carbide effusion studies of, 460 Thorium oxide effusion studies of, 467 Three-membered rings hybridization of bonds in. 506 Thulium intermetallic compounds of, 121 Thylakoids structure of, 316 Tin intermetallic compounds iron compounds of, 119-20 organic compounds of heats of combustion of, 455 shock compression of, 360 Titanium ethane absorption on, 137 intermetallic compounds of superconducting magnet, material from, 128 Tobacco mosaic virus sequence of, 375 Toluene theoretical calculation concerning, 264 theoretical dipole moment of, 270 Toluic acids heats of formation of, 452 Transition elements filled d-shells in intermetallic compounds, 114 Transition metal complexes

optical rotation in, 307-9

Transition metals

of, 110 Transition states compressibility of, 350-52 cyclic, 353 Transport processes isothermal, 474 non-isothermal systems, 475-76 Transport properties intermolecular forces from, 63 liquid helium-3, 92-95 theory of, 55 Transport theory Brownian motion, 405-6 correlation functions, 399-400 generalized Boltzman equations for, 396-98 generalized master equations for, 398-99 relaxation processes, 404transport coefficients. 400-2 Transuranic elements history of, 3-4 Trichloroethylene copolymers with vinyl acetate, 355 Triethylamine hydrogen bond heat of formation for, 73 Triethyl phosphate reaction with isopropyl iodide pressure dependence of, 355 Triethylsilane reducing agent for catalyst preparation, 145 Trifluoroacetic acid proton transfer in, 15 Trifluoromethylnitrate sixfold barrier to internal rotation in, 233 Trimethyl acetic acid acid association of, 15 Trimethyl aluminum decomposition of, 458 Trimethylamine reaction with isopropyl iodide pressure dependence of, Trimethylammonium ion

protolysis of, 14

Trimethylene oxide

Trimethyl gallium

pyrolysis of, 462

Trimethylene oxide

Trimethyl silane

structural study of, 245

structural study of, 245

microwave spectrum and

structure of, 244

Trinitrobenzene electron paramagnetic resonance study of, 208 Triphenylarsine heat of combustion of, 455 Triphenyl methyl electron paramagnetic resonance of exchange reactions, 205 spin density of, 204 Triplet state aromatic and ketone systems, 23 electron paramagnetic resonance studies of, 214-17 in electron dimer e<sub>2</sub>, 22-23 electron paramagnetic resonance study of single crystals, 216 porphyrins, 343 triplet-triplet annihilation, 327-28 Tritium acceleration targets for neutron production, 4 adsorption of, 138 dating with, 5 discovery of, 2 tracer isotope, 1 Tropyl radical electron paramagnetic resonance study of. 205 Tryptophan from photolysis, 24 Tungsten chemisorption of, 133 complexes of, 21 ethane adsorption and reactions on, 137 intermetallic compounds with technetium, 128 Tungsten films structure from electron microscopy, 133 Tunnelling electron transfer reactions, 161, 183-84 L-Tyrosine tyrosyl radical from photolysis of, 24 H

Ultrahigh vacuum techniques surface chemistry and, 131
Ultrasonics hydrolysis of potassium cyanide, 16 rotational isomerism study using, 356 viscosity measurements on liquid helium-3, 93
Ultrasonic spin resonance relaxation in solids, 200

change of protein spectra on melting, 443 nucleic acid fluorescence, 382 nucleic acid spectra table of, 380 nucleic acid studies, 379-83 Uranium intermetallic compounds of, 126 Uranium carbide effusion study of, 460 heat of combustion of, 455 Uranium hexafluoride heat of formation of, 455 Uranium oxide effusion study of, 460

Ultraviolet spectroscopy

# V Valence electron contribution

relation to Fermi surfaces,

113 Valence electrons importance in formation of intermetallic compounds, 110-11 Vanadium ethane adsorption and reaction on, 137 heat of combustion of, 455 intermetallic compounds of, 127 Vanadium carbide heat of combustion of, 455 Vanadium nitride heat of combustion of, 455 Vanadium tetrachloride heat of formation of, 457 Van der Waals forces theoretical calculations of, 254 Van der Waals gas metastability in, 410 Vaporization thermodynamics of, 460 Vapor pressures measurements of, 75 measurements of aqueous hydrogen halides, 473 Vibration-rotation interaction theoretical discussion of. 226-27 Vinyl acetate copolymer with tri- and tetrachloroethylene, 355 Vinylacetylene adsorption of, 143 Vinyl chloride heat of formation of, 457

quadrupole coupling constants for, 245 Vinyl polymers elastomer properties of, 422 Vinvl silane charge transfer in, 512 microwave spectrum and structure of, 244 Virial coefficients dielectric, 67 experimental procedures, 75 hard sphere approximations table of, 40 intermolecular forces from, 63-64 related to cluster integrals, theoretical hard sphere gas, 409 Virial expansion theory of liquids and, 33-35 Viscosity denaturation of nucleic acids and, 384 experimental measurements of, 66 Leonard-Jones parameters from, 65 liquid helium-3, 87, 93-546 measurements on high molecular weight nucleic acids, 388 relation to diffusion, 67 relation to rotational relaxation, 404 temperature dependence measurements of, 406 theoretical calculations of, 402

## w

Water adsorbed spectroscopic study of, 146-47 anisotropy in, 361 average structure for. 227 bond energy of, 456 copper impurities in, 4 energy lowering for, 267 heat of ionization of, 474 ionization constant of pressure dependence of, 358 irradiation of, 213 microwave spectroscopic study of adsorbed, 146 molecular integral for, 263 nuclear magnetic resonance isotope shifts in, 518

nuclear magnetic resonance study of oxygen-17, 510 perdeutero irradiation of, 213 photolysis of, 21 reaction with solvated electrons, 22 solubility in benzene of, 68 structure of, 68 substitution rate in metal complexes, 19 theoretical treatment of, 55 see also Ice Watermelon approximation virial coefficients calcu-

lated using, 409

chemical shifts of, 515 chemisorption on metals, 133 immiscibility with neon, 366 thermal conductivity of, 407 Xenon-129 nuclear magnetic resonance of, 498 Xenon difluoride theoretical torsion barrier for, 246 Xenon monofluoride from irradiated xenon tetrafluoride, 208 Xenon oxide theoretical work on, 272 Xenon tetrafluoride heat of formation of, 458 irradiation, to produce xenon monofluoride. theoretical torsional barrier for, 264 Xenon trioxide heat of formation of, 458 X-ray absorption change on chemisorption, 135 X-ray diffraction crystallinity of polymers, 423 electron counting in metal structures, 114 nucleic acid studies, 372-76, 389 protein structure, 441 X-rays liquid structure, 45 radial distribution functions, 36 used to measure opalescence, 415

X-ray scattering low angle photosynthesis pigment study, 315-17 p-Xylene carbon-13 hyperfine electron paramagnetic resonance splitting in, 205 hydrogenation of, 144 nitration of pressure dependence of, 355 **Xylenes** theoretical calcula-

tions concerning,

264

Ytterbium metal-nonmetal-metal transitions in, 362 Yttrium metal compounds of, 120-25 Z

Zeolites

Zero sound

on, 147-48

liquid helium-3, 95-97

magnesium compounds of, 111 surface hydration of, 147 Zinc oxide electron paramagnetic resonance study of adsorbed oxygen on, 149 Zirconium combustion of, 449 intermetallic compounds of, 127 infrared study of adsorption Zirconium hydride heat of combustion of, 455 surface hydration of, 147 Zwitter ions nucleotide as, 378-79 protolysis reactions with, 15

Zinc

